

THE SPIDER SUBFAMILY CASTIANEIRINAE OF NORTH AND CENTRAL AMERICA (ARANEAE, CLUBIONIDAE)¹

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ABSTRACT

A new subfamily, the Castianeirinae, is proposed for most of the clubionid members of the Micariinae (a gnaphosid subfamily). This revision includes the four genera (*Castianeira*, *Mazax*, *Myrmeco-*

typus, and *Sphecotypus*), with 59 species, that represent this subfamily in North and Central America.

Seventeen species are newly described: *Castianeira thalia*, *C. occidentis*, *C. alfa*, *C. athena*, *C. rothi*, *C. azteca*, *C. zembla*, *C. rica*, *C. alba*, *C. guapa*, *C. abuelita*, *C. trimac*, *Mazax xerxes*, *M. chickeringi*, *M. ajax*, *Myrmecotypus olympus*, and *M. orpheus*. One new name is proposed, *Mazax pax*, and 16 new synonymies recognized.

The evolution of the group, with special emphasis on the impact of selection for ant mimicry, is discussed.

INTRODUCTION

The Castianeirinae, newly proposed in this revision, is a subfamily of the Clubionidae. It represents a major portion of the old Micariinae of Simon (1897). Although no comprehensive revision of this group has ever been published, three works include a good number of the species: O. P.-Cambridge (1889-1902), F. P.-Cambridge (1897-1905), and Chickering (1937).

The group is world-wide, though predominantly tropical. This revision includes the fauna of North and Central America. The Central American fauna represents merely the small part of a vast array of species in the tropics of South America. Many members of the Castianeirinae exhibit ant mimicry, a phenomenon that has greatly influenced the past and present classification of the group.

¹ This study is part of one presented to the Department of Biology at Harvard University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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RECLASSIFICATION OF THE MICARIINAE

The Micariinae as recognized by Roewer (1954) and Bonnet (1961) is a subfamily of the Clubionidae. The predominantly holarctic ant-mimicking genus, *Micaria*, is the type-genus of the subfamily. Table 1 includes the 39 genera in the subfamily with their 368 species. This subfamily is not only polyphyletic but includes representatives of at least three other spider families and two clubionid subfamilies.

First, the type-genus, *Micaria*, should be placed in the family Gnaphosidae and not in the Clubionidae. Locket and Millidge (1951) point out the intermediate position of the genus between the Clubionidae and Gnaphosidae and also conclude that it should be placed in the Gnaphosidae. The following reasons account for this placement:

(1) The anterior spinnerets are cylindrical, moderately sclerotized, and fairly widely separated. Locket and Millidge (1951) observe that they "are not separated noticeably as in the Gnaphosidae," but neither are they the conical, unsclerotized, adjacent anterior spinnerets typical of the Clubionidae. In balance they are more gnaphosid than clubionid.

(2) The genital structures are more like those of the Gnaphosidae than the Clubionidae. Jackson (1932) states, "I believe these *Micariae* should be assigned to the family Gnaphosidae with which they entirely agree in the structure of their sexual organs. Their resemblance to the genus *Phrurolithus* of the Clubionidae is due to convergence. . . ." Both the male pedipalps and female epigyna are basically gnaphosid, the genital bulb of the male often oval with the embolus arising from its center, as in species of *Gnaphosa*, *Drassodes*, and *Geodrassus*, and the epigyna exhibiting a complexity found in the gnaphosids but not in the clubionids.

(3) The posterior median eyes are ob-

long (as is common in the Gnaphosidae) and not circular (as in all Clubionidae) (Locket and Millidge, 1951).

(4) Homann (1950) found the internal structure of the eyes of *Micaria* to resemble that of the Gnaphosidae (*Zelotes*) and to differ from that of the majority of recognized clubionid genera studied.

(5) "The leg scopulae consist of little spines which though widely spaced, are definitely spatulate; in Clubionidae of this size (e.g., *Phrurolithus*) the scopula hairs are aculeate" (Locket and Millidge, 1951).

Therefore *Micaria* and its closely related genus *Micariolepis* (a total of 108 species) must be transferred to the Gnaphosidae, taking the name of their subfamily, the Macariinae, with them.

Five of the remaining 37 genera (representing 13 species)—*Chemmis*, *Anachemmis*, *Heterochemmis*, *Parachemmis*, and *Drassylochemmis*—are apparently Liocraninae. They have from four to six pairs of long spines on the tibia of the first pair of legs; the hairs on the abdomen are all simple; the epigyna and male pedipalps are similar to the liocranine genus *Agroeca*; and the labium, sternum, and endites are characteristically like those found in the Liocraninae. When describing *Drassylochemmis*, Gertsch and Davis (1936) placed the new genus in the Liocraninae and remarked on its close resemblance to *Anachemmis*.

Fifteen of the genera in Table 1 (accounting for 206 of the remaining 247 species) clearly constitute a monophyletic taxon within the Clubionidae. This taxon is of subfamilial rank. The largest genus of the old Micariinae is also the largest genus in this group—*Castianeira*, with 118 species. For this reason, and also because the only family-group name in the group, Myrmecidae Koch, 1851, is also used as a family-group name in the Formicidae (the Myrmeciinae), the name of this subfamily should be Castianeirinae. The new sub-

TABLE 1. GENERA IN THE MICARINAE ACCORDING TO ROEWER (1954), WITH NEW CLASSIFICATIONS

GENUS (TYPE-SPECIES)	AUTHOR	GEOGRAPHICAL DISTRIBUTION	NUMBER OF SPECIES	NEW CLASSIFICATION
<i>Ceryda</i> (<i>C. cursitans</i>)	Simon, 1909	Australian	1	Molycriinae ¹
<i>Honunius</i> (<i>H. quadricauda</i>)	Simon, 1908	Australian	1	Molycriinae ¹
<i>Jacacna</i> (<i>J. distincta</i>)	Thorell, 1897	Oriental	1	Molycriinae ¹
<i>Molycria</i> (<i>M. mammosa</i>)	Simon, 1887	Australian	4	Molycriinae ¹
<i>Myandra</i> (<i>M. cambridgei</i>)	Simon, 1887	Australian	2	Molycriinae ¹
<i>Sphingius</i> (<i>S. thecatus</i>)	Thorell, 1890	Oriental	12	Corinninae?
<i>Pescennina</i> (<i>P. epularis</i>)	Simon, 1903	Neotropical	1	?
<i>Achalaicola</i> (<i>A. vestita</i>)	Mello-Leitão, 1943	Neotropical	1	Prodidomidae
<i>Actius</i> (<i>A. decollatus</i>)	O. P.-Cambridge, 1896	Oriental	1	Castianeirinae
<i>Anachemmis</i> (<i>A. sober</i>)	Chamberlain, 1920	Nearctic	3	Liocraninae
<i>Anatea</i> (<i>A. formicaria</i>)	Berland, 1927	Australian	1	Theridiidae
<i>Apochinomma</i> (<i>A. formicacforme</i>)	Pavesi, 1881	Ethiopian Oriental Neotropical	2 3 8	Castianeirinae
<i>Cambalida</i> (<i>C. insulana</i>)	Simon, 1910	Ethiopian	3	?
<i>Castanilla</i> (<i>C. quinquemaculata</i>)	Caporiacco, 1936	Palearctic	2	Castianeirinae
<i>Castianeira</i> (<i>C. rubicunda</i>)	Keyserling, 1879	Palearctic Ethiopian Oriental Neotropical Nearctic	6 21 7 59 25	Castianeirinae
<i>Chemmis</i> (<i>C. frederici</i>)	Simon, 1898	Neotropical Nearctic	4 1	Liocraninae
<i>Coenoptychus</i> (<i>C. pulcher</i>)	Simon, 1885	Oriental	1	Castianeirinae
<i>Copa</i> (<i>C. flavophumosa</i>)	Simon, 1885	Ethiopian Oriental	8 2	Castianeirinae
<i>Corinnomma</i> (<i>C. severum</i>)	Karsch, 1880	Ethiopian Oriental Australian Neotropical	1 8 2 1	Castianeirinae
<i>Donuea</i> (<i>D. decorsei</i>)	Strand, 1932	Ethiopian	1	?
<i>Drassyllochemmis</i> (<i>D. captiosus</i>)	Gertsch and Davis, 1936	Nearctic	1	Liocraninae
<i>Graptartia</i> (<i>G. granulosa</i>)	Simon, 1896	Palearctic Ethiopian	1 1	Castianeirinae

¹ Lehtinen (1967) places the Molycriinae (= Myandrinae) in the Prodidomidae. Also see footnote p. 166.

TABLE 1. (Continued)

GENUS (TYPE-SPECIES)	AUTHOR	GEOGRAPHICAL DISTRIBUTION	NUMBER OF SPECIES	NEW CLASSIFICATION
<i>Heterochemmis</i> (<i>H. mirabilis</i>)	F. P.-Cambridge, 1899	Neotropical	2	Liocraninae
<i>Liparoehrysis</i> (<i>L. resplendens</i>)	Simon, 1909	Australian	1	?
<i>Mazax</i> (<i>M. pax</i>)	O. P.-Cambridge, 1898	Neotropical	5	Castianeirinae
<i>Mercenius</i> (<i>M. plumosus</i>)	Simon, 1909	Ethiopian	10	Castianeirinae
<i>Messapus</i> (<i>M. martini</i>)	Simon, 1898	Ethiopian	2	?
<i>Methesis</i> (<i>M. semirufa</i>)	Simon, 1896	Australian Neotropical	1 1	Corinninae ?
<i>Micaria</i> (<i>M. fulgens</i>)	Westring, 1851	Palaeartic Ethiopian Oriental Australian Neotropical Nearctic	59 2 1 2 4 37	Gnaphosidae Micariinae
<i>Micariolepis</i> (<i>M. dives</i>)	Simon, 1897	Palaeartic Ethiopian	2 1	Gnaphosidae Micariinae
<i>Montebello</i> (<i>M. tenuis</i>)	Hogg, 1914	Nearctic	1	?
<i>Myrmecium</i> (<i>M. rufum</i>)	Latreille, 1824	Neotropical	16	Castianeirinae
<i>Myrmecotypus</i> (<i>M. fuliginosus</i>)	O. P.-Cambridge, 1894	Neotropical Nearctic	7 1	Castianeirinae
<i>Myrmecques</i> (<i>M. attarum</i>)	Roewer, 1935	Neotropical	1	?
<i>Parachemmis</i> (<i>P. fuscus</i>)	Chickering, 1937	Neotropical	2	Liocraninae
<i>Poecilipita</i> (<i>P. janthina</i>)	Simon, 1896	Australian	2	Castianeirinae
<i>Psellocoptus</i> (<i>P. flavostriatus</i>)	Simon, 1896	Neotropical	1	Castianeirinae
<i>Sphecotypus</i> (<i>S. niger</i>)	O. P.-Cambridge, 1895	Oriental Neotropical	2 1	Castianeirinae
<i>Supuma</i> (<i>S. insularis</i>)	Simon, 1896	Australian	8	?

family is established and defined in the taxonomic section of this paper.¹

Five genera (with 9 species) have pre-

viously been grouped in the subfamily Molycriniinae (the Molycricae of Roewer, 1954) and probably should again be considered a separate subfamily.

The type-species of *Methesis* (from Bolivia) is probably in the Corinninae, but the Australian member of the genus is clearly in the Castianeirinae. *Sphingius* is also probably in the Corinninae.

Two monotypic genera belong in other

¹ In his illuminating reclassification of the Araneomorpha, Lehtinen (1967) considers the Clubionidae to be a highly polyphyletic family. He places the Micariinae in the Gnaphosidae and raises the Corinninae and Liocraninae to familial status. Within this framework the Castianeirinae should be considered a subfamily of the Corinnidae.

distinct families. *Anatea* Berland has recently been redescribed and discovered to be in the family Theridiidae (Reiskind and Levi, 1967). Berland (1927) based his placement on the general antlike shape and the simple male genitalia (which superficially resembles that of *Micaria*). *Achalaicola* Mello-Leitão is in the Prodidomidae, a rare family related to the Clubionidae and Gnaphosidae.

The remaining eight genera, five of which are monotypic, may be members of the Castianeirinae, gnaphosids in the Micariinae, or members of entirely different taxa. Only careful examination and study will place them.

ANT MIMICRY AND ITS EFFECTS ON CLASSIFICATION

Ant mimicry is fairly common among spiders (Brignoli, 1966) and is most dramatic and widespread among the salticids and clubionids. The mimicry is basically Batesian: the innocuous mimic (spider) is protected by its resemblance to a noxious model (ant or velvet ant) by being mistaken for the model by potential predators.

Two results of selection for mimicry—convergence and extreme specialization—have produced errors in classification.

The convergence of superficial antlike characteristics in the mimics of several families of spiders led Walckenaer (1841) to create the genus *Myrmecia*, in which he included both clubionid and salticid ant mimics. Berland (1927) described an ant-mimicking spider, *Anatea formicaria*, and placed it among the ant mimics of the Clubionidae, although it is actually a theridiid (Reiskind and Levi, 1967). O. P.-Cambridge (1870) included *Aphantochilus*, an ant mimic related to the Thomisidae, in a group of clubionid ant mimics. Table 1 reviews the polyphyletic old Micariinae, which contained ant-mimicking clubionids (the new subfamily Castianeirinae) and gnaphosids (the new Micariinae).

Two families, which include only spiders

that imitate ants, have been proposed. Koch (1851) established the family Myrmecidae, which included mostly clubionid ant mimics, with *Myrmecium* as the type-genus. The Aphantochilidae of Thorell, 1873, are thomisidlike spiders all mimicking cephalotine ants; the family includes four genera, with a total of eight species.

Specialization has also led to many ant-mimicking genera (e.g., *Myrmecium* and *Sphecotypus* in the Castianeirinae) that are satellites of a more generalized genus (e.g., *Castianeira* in the Castianeirinae) and earn their generic position by their bizarre and superficial mimetic characters.

Equal weighting of characters in the taxonomic analysis of a group that includes ant mimics would probably result in as absurd a classification as some of the foregoing examples. The external morphology is so extensively modified in ant mimics that carefully chosen characters, as little affected by selection for mimicry as possible, must be used in their proper classification.

PHYLOGENETIC RELATIONSHIPS OF THE GENERA

In attempting to trace the evolutionary history of a taxon, two basic approaches are used simultaneously—determination of (1) the real, homologous similarities between the taxon and its relatives, i.e., the phylogenetic relationships, and (2) the changes and differences resulting from evolutionary adaptations within the taxon itself. In both cases natural selection expresses itself in varying evolutionary rates for different characters.

Each character (or pleiotropic complex of characters) has its own evolutionary rate dependent upon the positive or negative selection on the character. This results in a taxon some of whose characters are "advanced" (i.e., the result of a high evolutionary rate and therefore new and different) while other characters are "primitive" (i.e., the result of a low evolutionary

rate and therefore similar to the characters of the ancestral taxa). When speaking of an "advanced" or "primitive" taxon, it is necessary to state clearly the characters being used. Sometimes a taxon is truly primitive, combining a vast group of primitive characters, e.g., the Liphistiidae, but usually it is a mixture of primitive and advanced characters; the taxon's "primitiveness" is a result of the subjective weighting of certain characters by the investigator. Characters of the same level of "primitiveness" usually do not group themselves, and for this reason the evolutionary history of a taxon must first be considered character by character. Only after such an analysis can speculation on the history of the taxon, as the total of all of its characters, take place.

Such an analysis of several important characters studied in the North and Central American Castianeirinae follows. These characters are (1) male genitalia, (2) female genitalia, (3) eye arrangements, (4) cheliceral teeth, (5) thoracic groove, and (6) mimetic characters.

Male genital structure. The tarsus of the male spider is modified as a copulatory organ for the transfer of sperm to the epigynum of the female. This structure is relatively distinct from species to species.

The male genital structure in the Castianeirinae is relatively simple compared to that in most spiders. As noted in the definition of the Castianeirinae, there is a basic pattern of homologous structures in all the male genitalia—the major piece of evidence that the whole subfamily is definitely a monophyletic taxon. The characteristics of the genitalia held in common include a tibia either with a small apophysis or lacking one entirely; a full, lateral, protective cymbium; and a genital bulb that has a globose base, is more or less elongated distally, and has a winding, highly sclerotized palpal duct that terminates at its distal end in a heavily sclerotized embolus (see Fig. 2).

Of the structures making up the male pedipalp, the embolus is the most complex and is species specific. The embolus of the most common American species of *Castianeira*, *C. longipalpus*, is typical of the vast bulk of the *Castianeira*. The embolus is straight, highly sclerotized, and has a spiral twist at its end (Fig. 10). In some, this terminal twist is barely detectable, e.g., *C. descripta* (Fig. 91), while in others it is very distinct, e.g., *C. cingulata* (Fig. 103). In several species of *Castianeira* the twist is completely dominant and the whole embolus is spirally twisted, e.g., *C. rubicunda* (the type-species), *C. memnonia* (from Panama; Fig. 196), and *C. trilineata* (Fig. 110). Which is the more primitive characteristic—a straight, fairly long embolus or a low, strongly twisted one? Two factors support the latter alternative.

First, a twist is present in most *Castianeira*, though barely perceptible in some (e.g., *C. nanella*, *C. descripta*, *C. athena*). These traces of a twist point to the probably vestigial nature of the structure. The lengthening and straightening of the terminal third of the genital bulb of *C. trilineata* (Fig. 110) could produce the emboli observed in *C. longipalpus* and *C. variata* (Fig. 23).

Second, the "primitive" (i.e., complex and low) twist (counterclockwise in the left palpus and clockwise in the right palpus) most clearly exemplified in *C. memnonia* (Fig. 196) is also seen in some species of the distinct genera *Myrmecotypus* (*M. olympus*) and *Myrmecium*. That such complex and homologous structures arose at least three times is highly unlikely. It is more likely that the ancestral palpus had a low twist; in some species, through time, the embolus has lengthened, often to the extent of leaving but a vestige of the twist or no twist at all. Within the *Castianeira* the whole range of palpus evolution is exhibited: *C. memnonia*, *C. trilineata*, *C. cingulata*, *C. longipalpus*, *C. descripta*. The male genital index (a measure of the elon-

gation of the embolus, a high value representing a highly elongated embolus) is useful in species determination in *Castianeira* but is a poor measure of whether the palpus is advanced or primitive. Such a determination can come only from studying the structure of each tip.

Myrmecotypus has a more varied collection of terminal genital structures than does *Castianeira*, which may suggest a possible polyphyletic origin of the genus. *Myrmecotypus olympus* and *M. rettenmeyer* have low, spirallike ends, the former with a large sclerotized embolus (Fig. 260) and the latter with a very short embolus (Fig. 262). *M. orpheus* (Fig. 257) and *M. niger* (Fig. 244) have two small terminal projections, clearly a conductor and an embolus in the latter case and probably also in the former. (The embolus is at the distal terminus of the palpal duct.) In *Myrmecotypus* (except *M. pilosus*) there seems to be a general tendency for simplification of the terminal structures instead of a trend towards elongation.

In *Mazax* the embolus is a small, thin, twisted structure in the *spinosa* and *pax* species groups. *Mazax ajax* has a straight, fairly thick embolus without a terminal twist.

Within the genital bulb, the palpal duct (the "receptaculum seminis" of Comstock, 1940) runs down the neck from the embolus and into the globose section, where it makes one or more loops and then proceeds internally (within the genital bulb) and out of view. This basic pattern is typical of all members of the Castianeirinae, but there are some variations of the pattern that are constant within certain taxa and are useful in determining relationships. Old World species of *Castianeira*, *Corinnomma*, and *Merenius* usually have the palpal duct running down the medial side of the genital bulb, making then a single lateral loop. In the New World only *Myrmecotypus pilosus* exhibits this pattern, which suggests an Old

World origin of this species. The New World forms usually have more than one loop. All New World *Castianeira* have two loops, one on either side of the descending main palpal duct—a lateral loop and a medial loop (Fig. 2). The lateral loop is larger and extends to the distal portion of the globose section of the genital bulb, while the medial loop is smaller and is limited to the basal half of the globe. The medial loop in *Castianeira trilineata* and *C. memnonia* is very small. *Myrmecotypus niger* also has clear lateral and medial loops (Fig. 243) whereas *M. olympus*, *M. orpheus*, and *M. rettenmeyer* have two distinct loops both medial to the main palpal duct (Figs. 255, 260, 262). This latter pattern is apparently found only in the *olympus* species group of *Myrmecotypus*. The other major neotropical genus of the Castianeirinae, *Myrmecium*, also has two loops in the globe similar to those of *Castianeira*. In *Mazax* two loops are present with the medial loop very small in *M. pax* and the *spinosa* species group, and quite large in *M. ajax*.

In two cases, *C. trilineata* and *M. olympus*, the basal portion of the lateral side of the cymbium bears a spine or spines. In the former species a single heavy spine is present, while in the latter there is a group of spines (Fig. 261). It is possible that this is a unique and primitive character.

In sum, the male genital structure confirms that the subfamily is definitely monophyletic; the common ancestral pedipalp had an embolus similar to that of the present-day *Castianeira memnonia* and a globose genital bulb base containing one or more palpal duct loops. The relatively conservative arrangement of these loops suggests a basic division of the *Castianeira* into a New World group and an Old World group and a polyphyletic origin of *Myrmecotypus*.

Female genital structure. The internal structure of the epigyna of Castianeirinae

is extremely similar throughout the subfamily. The highly sclerotized spermathecae usually have a large anterior section (often globose) narrowing to a posterior neck. Tubelike bursae copulatrices join the spermathecae to the pair of intromittent orifices (Fig. 3). Because the structures are so simple, they are of value as characters only on the highest (evidence of the monophyly of the subfamily) and lowest (diagnostic difference between some species groups in *Castianeira*) levels. There is no clear relationship between the embolus structure of the male and the epigynal structure of the female.

Eye arrangements and sizes. Eye arrangements have long been the basic taxonomic stand-by of arachnologists. They have been considered highly conservative and therefore trustworthy. In the North and Central American Castianeirinae there are three basic eye arrangements and size relationships which belong to the three major genera. *Castianeira*: anterior row moderately recurved; posterior row weakly to moderately procurved; eyes all moderately small to large, sometimes the anterior median eyes larger than the laterals (e.g., *C. memnonia*, *C. dubia*, *C. alba*, and *C. rica*). *Myrmecotypus*: anterior row moderately recurved; posterior row recurved; eyes all moderately small, except anterior median eyes twice the diameter of anterior lateral eyes. *Mazax*: anterior row moderately recurved; posterior row approximately straight; eyes moderately large, with the anterior median eyes slightly smaller than the laterals. Many other characters (e.g., thoracic groove, presence of an abdominal petiole, and carapace shape) reinforce the divisions made on the basis of eye characters. This seems to substantiate the value of the eyes as conservative characters.

Cheliceral teeth. The two rows of teeth on the sides of the fang furrow consist of at least two teeth each, but often there is an additional denticle at the distal end of

the promargin teeth. This denticle is strong in some, vestigial and almost absent in others. For this reason a strong denticle is considered primitive. In only two species of the North and Central American fauna is this denticle large enough to be considered a tooth: *Castianeira memnonia* and *Myrmecotypus pilosus*. The complete absence of the denticle has occurred independently in several groups of *Castianeira* (e.g., *C. abuelita*, *C. occidentis*, and *C. dorsata*) and in the *fuliginosus* group of *Myrmecotypus*.

Thoracic groove. The thoracic groove or fovea (Fig. 1a) is generally present in *Castianeira* and is always absent in *Myrmecotypus*. In the latter it is usually replaced by a shallow thoracic impression. *Mazax* usually has a weak groove, though it is strong in the atypical species, *Mazax ajax*.

The groove is the external manifestation of an apodeme for the attachment of muscles. The size of the spider may influence the groove's size and depth (larger *Castianeira* generally have stronger grooves), but this does not account for the differences between *Castianeira* and *Myrmecotypus*, which are probably phylogenetic and fundamental.

Mimetic influences. The selection for ant mimicry in spiders influences both their morphology and their behavior, as well as their ecology, habitat preference, and physiology. In the section on methods, the use of certain morphological indices as mimicry indicators is outlined.

Within the Castianeirinae, three of the four genera of North and Central America can generally be distinguished by certain characters resulting from mimetic selection: *Mazax* has a long, rugose abdominal petiole; *Myrmecotypus* has a wide cephalic region; *Sphecotypus* is elongate and has a highly constricted carapace separating a distinct "head." *Castianeira*, containing weak to strong mimics and some non-

mimics, has a more generalized body form, with a cephalothorax and an abdomen without strong constrictions or expansions. Non-mimetic forms of *Castianeira* probably represent the general appearance of the progenitor of the Castianeirinae.

Bicolored carapaces in several species (e.g. *C. cingulata*, *C. rothi*, *C. guapa*, and *Mazax xerxes*) give the impression of a "head" separated from a "thorax."

In *Mazax*, the basic mimetic configuration probably coincides with its single origin, i.e., it is probably monophyletic. The mimetic characteristics in *Myrmecotypus* may well be convergent (see *Male genital structure*, above), whereas the generalized characters in *Castianeira* give that genus a general, all encompassing aspect.

Emphasis on characters not influenced by mimicry (e.g., genital structures and thoracic groove) has prevented some polyphyletic groupings—the subfamily is clearly monophyletic—but the vast impact of mimicry has possibly preserved others, e.g., *Myrmecotypus*, and raised bizarre forms to the generic level, e.g., *Sphecotypus*.

Conclusions. From all the characters considered above, two of the three major genera, *Castianeira* and *Mazax*, are probably monophyletic. The coincidence of the peculiar eye arrangements and sizes with the presence of an abdominal petiole confirms *Mazax*'s single origin. *Castianeira* has a generalized appearance and much variability, and although monophyletic, may coincide with the whole subfamily, deriving its monophylety from its all-inclusive quality.

The third major genus, *Myrmecotypus*, appears to be monophyletic when eye, thoracic groove, and mimetic characters are considered, but the great variation in male genital structure suggests a polyphyletic group. Much more study of more extensive collections will be needed to clarify this group; for the time being both convenience and prudence necessitate its unity.

ZOOGEOGRAPHY

The revision is geographically limited to the Nearctic and northern end of the Neotropical faunal regions. The Castianeirinae found in this area accurately reflect the same general faunal region boundaries as those often observed in vertebrate distributions. Except for some Neotropical incursions into southern Texas and Florida (*Castianeira cubana* and *Mazax pax*) and some Nearctic incursions into Cuba (*C. floridana*) and perhaps southern Mexico, most of the species groups are in either the Nearctic or the Neotropical region. The Nearctic region can be divided into two areas: the North Temperate region and the Nearctic deserts. The North Temperate area contains the *longipalpus* (part), *amona*, *descripta* (except *C. occidentis*), *gertschi*, *trilineata*, and *cingulata* groups of *Castianeira*. The Nearctic deserts (southwestern U. S. and northwestern Mexico) contain the *dugesii* and *athena* and part of the *longipalpus* and *dorsata* groups of *Castianeira*, as well as *C. occidentis*. The Neotropical region includes the *dorsata* (part), *truncata*, *dubia*, *alba*, *similis*, *memnonia*, *cubana*, *peregrina*, and *cincta* groups of *Castianeira*. All *Mazax* and *Myrmecotypus* (except the atypical *Myrmecotypus lineatus*) are Neotropical. The species groups seem to be arranged the same way geographically as they are phylogenetically.

Castianeirinae is predominantly a tropical subfamily and probably originated in the tropics. Limitations both in the scope of this revision and in the collections from tropical South America and Africa prevent determination of the origin and distribution of the subfamily.

Presumably these spiders disperse mainly by ballooning. However, only a few species show wide distributions. Only two species occur in the West Indies (excluding Cuba)—*Mazax spinosa* and *M. chickeringi*, the latter endemic to Jamaica. *Mazax spinosa* on St. Vincent and St. Lucia probably came

through Trinidad and should be considered part of the South American fauna.

INTRASPECIFIC VARIATIONS

In addition to normal color size variations within a population, two types of intraspecific morphological variation are observed in the mature forms of these spiders: sexual and geographic.

Several secondary sexual characters are exhibited. The females are usually larger, have a wider cephalic region and a much smaller abdominal dorsal sclerite than the males. Sexual dimorphism, in conjunction with color and age variations, has been utilized in mimetic polymorphism.

Castianeira cubana and *Mazax pax* both have distinct geographical color forms and could be polytypic species, but this can be determined only when the discontinuities in the collecting have been eliminated. The posterior abdominal red spot in *Castianeira descripta* varies geographically in a cline from a very small spot in the north to a large one in the south and west (see Map 6). Several other species show geographic differences (e.g., abdominal pattern variations in *Castianeira variata* and size differences in *C. longipalpus*), but they are not distinct.

There are several closely related groups of allopatric species that, with further investigation, may turn out to be very variable single species (e.g., *Castianeira crocata*-*C. floridana*, *C. descripta*-*C. occidentalis*-*C. watlinghami*, and *C. amoena*-*C. alteranda*).

Size variations within a single species can be observed in the *Measurements* section under each species, which lists the range of each measurement.

MIMICRY

The ant mimicry exhibited in these spiders ranges from a very generalized sort to species-specific accuracy. The very generalized or familial ant mimics include many of the North American species (e.g., *Castianeira longipalpus*, *C. cingulata*, and *C.*

trilineata), which resemble moderate to large brownish or black ants. A more specialized group is that of the subfamilial and generic ant mimics (e.g., *C. rica* and *C. dubia* in Central America), which are accurate myrmicine or ponerine mimics. Finally, the specific ant mimics (e.g., *Myrmecotypus rettenmeyeri*, a Panamanian spider that resembles *Camponotus serceiventris*) have a single species as their model, and their mimetic modifications are clearly associated with that species.

A stable situation must exist for the more specific forms of mimicry to arise. The mimic must remain temporally and spatially sympatric with the model during the long period of selection for specific mimicry. The tropical forests offer such long range stability, and the most accurate mimics are found there.

Several species are likely mutillid wasp mimics, having red-orange spots or stripes on their abdomens. This coloration has apparently arisen in these species independently (see *Remarks* under *Castianeira dorsata*).

METHODS

The characteristics and measurements (and the indices derived from these measurements) used in describing and comparing the species covered by this revision were chosen using two separate criteria: (1) characteristics that delimit the true or phylogenetic differences between taxa (species or genera) or sexes, and (2) characteristics that exhibit the influence of selection for ant mimicry.

The quantitative measurements (listed below) are mainly of the exoskeleton and genital apparatus. With the exception of measurements of the genitalia, they are accurate to 0.05 millimeters. Measurements of the genitalia are accurate to 0.01 millimeters.

A section on Measurements precedes the description of each species. In this section the measurements of the type are presented

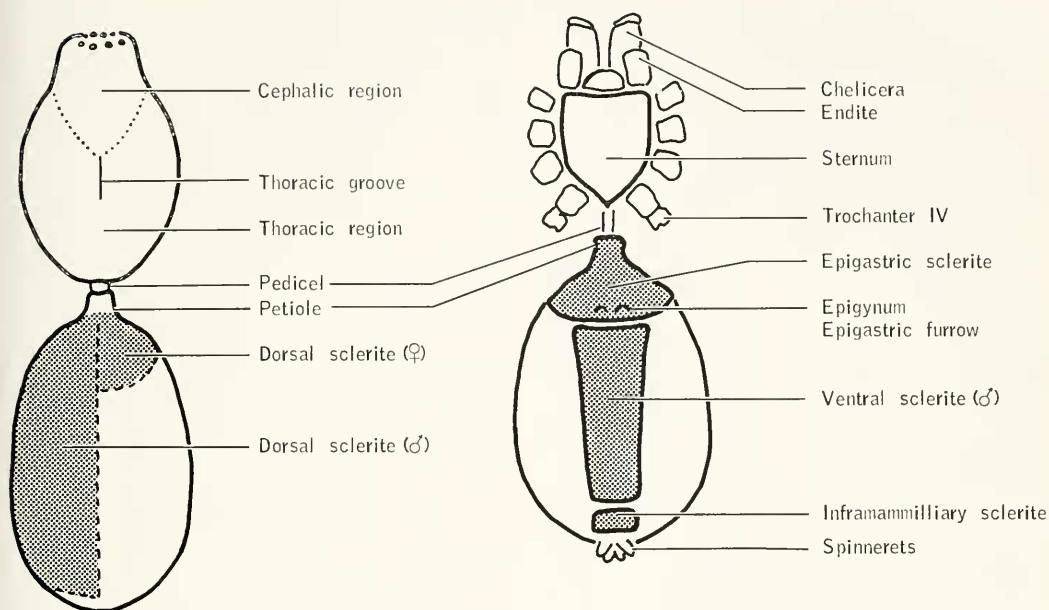


Fig. 1. Left, Dorsal view of spider (schematic). Right, Ventral view of spider (schematic).

first (if available), followed by the range of the other specimens measured. At least ten males and ten females of each species were measured, when possible, from throughout its geographic range. Averages and associated standard deviations are not meaningful when taken on these diverse samples.

All qualitative characteristics, as well as quantitative characteristics of a discontinuous nature, are included in the section entitled *Description*.

MORPHOLOGY AND MEASUREMENTS

Cephalothorax. The cephalothorax dorsally consists of a shell-like carapace with eight eyes at the anterior end (arranged in two rows), and often a longitudinal thoracic groove; it can be divided into a cephalic region and a thoracic region (Fig. 1a). Ventrally (Fig. 1b) there is a sternum, a labium and its bracketing endites (the coxae of the pedipalps), and a pair of chelicerae. The following measurements on

the cephalothorax are reported in this revision:

Carapace length: maximum longitudinal length of the carapace when viewed dorsally from the anteriormost area between the anterior median eyes to the posteriormost point of the carapace.

Carapace width: maximum width of the carapace when viewed dorsally.

Cephalic width: width of the cephalic region of the carapace at the level of the posterior row of eyes when viewed dorsally.

Sternum length: maximum length of the sternum when viewed ventrally. The length includes the posterior sclerotized extension of the sternum found in many species.

Sternum width: maximum width of the sternum (not including extensions of the sternum between the coxae) when viewed ventrally.

From these measurements several proportional indices are derived. Proportional indices are often useful in making objective

comparisons between different individuals in a population or species, or between different species or other taxa, because the emphasis on linear size, which is so variable, is diminished. Variation in the absolute size of a spider is dependent on many environmental conditions (length of growing season, abundance of food, etc.), but the relationships disclosed by the proportions often exhibit the actual phenotypic characteristics. For example, the carapace length of the females of *Castianeira longipalpus* ranges from 2.75 to 4.00 millimeters, but the carapace index (see below) ranges from 66–71, and the smallest and largest specimens have the same carapace index, 66.

The carapace and sternum indices (see below) are derived by dividing the width by the length.¹ Any elongation of these two structures will result in low index values. Because the ants are often thinner than the spiders that mimic them, and thinness and elongation in the spiders often enhance their mimetic resemblance, these two indices can be used as indicators of mimicry, very low values almost always indicating the morphological result of strong selection for mimicry. The following indices are derived from the measurements described above:

Carapace index: carapace width/carapace length $\times 100$. All indices are in the nearest whole unit. A high index value represents a wide carapace, whereas a low index value represents a narrow one. A mimicry indicator.

Cephalic width index: cephalic width/carapace width $\times 100$. This is an index of the narrowness of the head region.

Sternum index: sternum width/sternum length $\times 100$. This is another indication

of the degree of elongation in the cephalothorax. A mimicry indicator.

Legs. Many arachnologists report the length of every segment of every leg in the description of a spider. In measuring many hundreds of spiders this task is both tedious and often incomplete (due to the absence of some legs). In addition, within a certain taxon constant size ratios emerge. For example, in the *longipalpus* group of the *Castianeira* the length of femur IV (legs numbered using Roman numerals) is always between 25 and 28 per cent of the length of the whole leg IV, and the length of leg I is between 69 and 75 per cent of the length of leg IV. For these reasons, the only segment of the legs measured was the femur of leg IV, the longest leg segment in these spiders.

Femur IV length: the maximum length of the fourth femur when viewed laterally.

Femur IV width: the maximum width of the fourth femur when viewed laterally. The femur is usually widest at the level of the large dorsal spine near the proximal end of the dorsal edge of the femur, and the measurement includes the tubercle on which the spine is mounted, if it is present.

From these measurements the following indices are derived:

Leg thickness index: femur IV width/femur IV length $\times 100$. A low value indicates a thin leg and a high value a thick one. A mimicry indicator.

Leg length index: femur IV length/carapace length $\times 100$. This is a measure of the general stockiness of the spider, thinner spiders generally having a higher index value, and is therefore somewhat of a mimicry indicator.

Abdomen. The abdomen of the adult always has a dorsal sclerite, fully covering the abdomen in the male but often small or moderately small in the female. Ventrally both sexes have epigastric sclerites (on which the female has its epigynum)

¹Most of the indices are established so that they result in values below 100 (i.e., the smaller of two measurements divided by the larger). Hopefully these indices will be more easily comprehended than their reciprocals would be.

and often a small inframammillary sclerite just anterior to the spinnerets. In addition, the male has a ventral sclerite from the epigastric furrow running towards the inframammillary sclerite (Fig. 16).

The pedicel is the stalk between the cephalothorax and the abdomen and is usually very short and inconspicuous. In some species it is somewhat elongated.

The petiole is the narrowed extension of the abdomen anteriorly. In *Mazax* this is pronounced and heavily sclerotized (a dorsal extension of the epigastric sclerite).

The following measurements on the abdomen have been taken and are reported on in this study.

Abdomen length: maximum length of the abdomen when viewed dorsally.

Abdomen width: maximum width of the abdomen when viewed dorsally.

Dorsal sclerite length: maximum length of the dorsal abdominal sclerite when viewed dorsally. This and the following measurement are almost synonymous with the abdomen length and width in males, where the sclerite is usually full.

Dorsal sclerite width: maximum width of the dorsal abdominal sclerite when viewed dorsally.

Petiole length: maximum length of abdominal anterior petiole when viewed dorsally. This measurement has been taken only on members of the genus *Mazax*.

The following indices are derived from the measurements above:

Abdomen index: abdomen width/abdomen length $\times 100$. This is quite variable in the females. The non-sclerotized (non-rigid) portion of the abdomen varies greatly in size, depending on whether or not the spider is gravid and/or well fed. On the other hand, the abdomens of the males are completely covered by sclerites, and the index values are less variable. This is a good mimicry indicator, especially in the males.

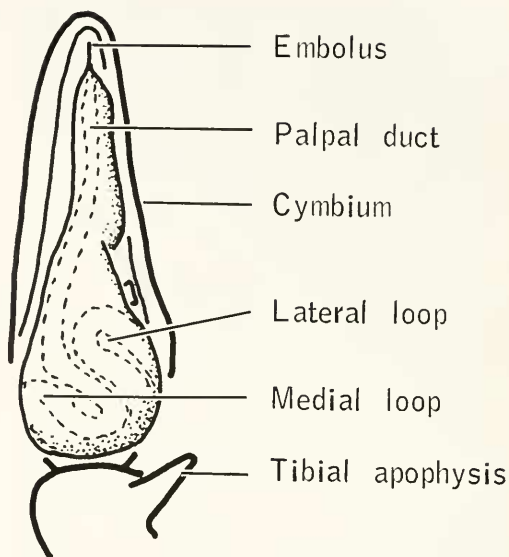


Fig. 2. Left male pedipalp, ventral view. (Genital bulb covered dorsally by the cymbium.)

Dorsal sclerite index: dorsal sclerite width/dorsal sclerite length $\times 100$.

Total length. The total length of a spider can be roughly calculated by adding the abdomen length and the carapace length.

Male genitalia. The separation of species is greatly facilitated by genital characteristics, the structures varying very little within a species.

In the pedipalps of mature male spiders, the tarsal segment is modified as an intermittent organ to hold the sperm. The sperm is emitted from the genital pore (at the center of the epigastric furrow) into a sperm web, taken into the genital bulb, and finally transferred to the epigynum of the female spider in mating. The pedipalps of all males of the Castianeirinae have a large cymbium covering the genital bulb dorsally. The genital bulb has a globular base and a narrower distal neck ending in a sclerotized embolus (Fig. 2). It contains a tubelike coiled canal, the palpal duct. In many, but not all, Castianeirinae the embolus is a fairly straight, highly sclerotized structure. In species having straight emboli

the following useful measurements have been made:

Embolus length: length of highly sclerotized portion of the distal end of the genital bulb when viewed ventrally.

Bulb length: length of entire genital bulb from bottom of globular region to tip of embolus.

And from these two measurements the following index is derived:

Male genital index: embolus length/bulb length $\times 100$. This index is remarkably constant within a species and is not correlated with any epigynal structures.

In the species in which the distal end of the genital bulb is strongly twisted, these measurements and the index derived from them cannot be made (e.g., *Castianeira memnonia*, *C. trilineata*, and several species of *Myrmecotypus*).

The arrangement of loops made by the palpal duct is also constant and invariable and is characteristic of certain taxa (species, species-groups, and genera). In all cases, the palpal duct runs a longitudinal tube towards the embolus from the basal portion of the genital bulb, where there are one or more loops.

Often there is a prolateral, heavily sclerotized tibial apophysis (Fig. 2); this is invariably simple.

In a few, isolated cases, there are heavy spines on the retrolateral base of the cymbium (e.g., *C. trilineata* and *Myrmecotypus olympus*).

Female genitalia. The epigyna of the females of the Castianeirinae are quite simple, with two openings (intromittent orifices) just anterior to the epigastric furrow, opening into a pair of tubelike bursae copulatrix leading to heavily sclerotized spermathecae, usually having an anterior bulb section and a posterior neck section, although the separation of the two sections is often vague and sometimes non-existent. The fertilization tubes leading from the spermathecae to the oviduct arise from the

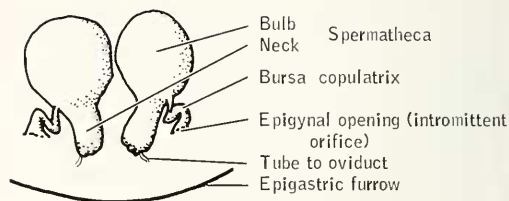


Fig. 3. Internal epigynum, dorsal view.

posterior ends of the spermathecae and are not sclerotized (Fig. 3).

The shape, size, and direction of the intromittent orifices, the shape of the spermathecae, and the simple convolutions of the bursae copulatrix are often useful specific characteristics.

MORPHOLOGY AND DESCRIPTIONS

The descriptions include the qualitative characteristics (color, general shape, distribution of hair, genital structures, etc.), discontinuous quantitative characteristics (spination, cheliceral teeth, abdominal setae), and some other quantitative characteristics (cephalic width index).

Color. The following range of color is used to describe the spiders: (from lightest to darkest) white, creamy white, yellow-white, yellow, yellow-brown, yellow-orange, orange, orange-brown, red-brown, brown, purple-brown (usually non-sclerotized surfaces), maroon, maroon-brown, brown-black, black. Most of these are modified by using "light," "dark," or "deep." But more important than the precise color is the relative color of different parts—i.e., the pattern. A leg may be described as orange-brown, and vary in the species from yellow-brown to red-brown, but if the tibia or leg I is described as lighter than the tibia of leg IV, it is usually a constant relationship.

Hair and setae. The hairs on the carapace are usually simple, short hairs, although they are often somewhat longer in the cephalic region. Often there are plumose, feather-like hairs (usually making up any longitudinal band of white hairs). The

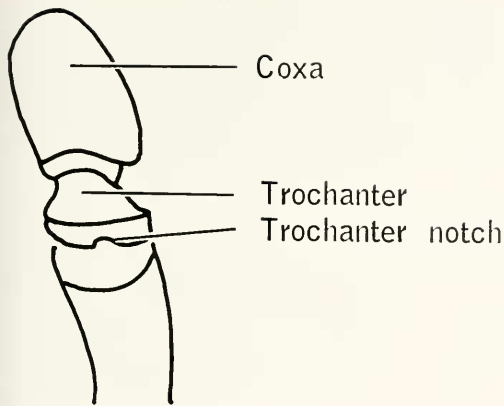


Fig. 4. Trochanter notch.

hairs of the abdomen are almost exclusively short and plumose. Abdominal hair patterns are often, but not always, reinforced by underlying pigment patterns (as the red abdominal spot in *C. descripta*, *C. crocata*, *C. floridana*, and *C. occidentis*).

The sternum is usually sparsely covered with long simple hairs or thicker setae (see section on abdominal setae below).

The legs are usually covered with non-erect, simple hairs, and density is expressed as lightly, moderately, or heavily hirsute.

Thoracic groove. The thoracic groove ("fovea" of British arachnologists) (Fig. 1a) is expressed as weak, moderately weak, moderate, moderately strong, or strong, depending on its length and depth. In some taxa it is entirely absent and is often replaced with a poorly defined thoracic impression.

Trochanter IV notch. On the distal, ventral margin of the trochanter (second segment of the leg) there is often a small notch (Fig. 4). This notch is usually rounded and is strong, moderate, weak, or absent.

Sculpture. Sculptural characteristics are not found extensively in the *Castianeira*, but are used in *Mazax*, where great differences in surface textures exist. Surfaces are described as granulose, rugose (full of wrinkles), or smooth.

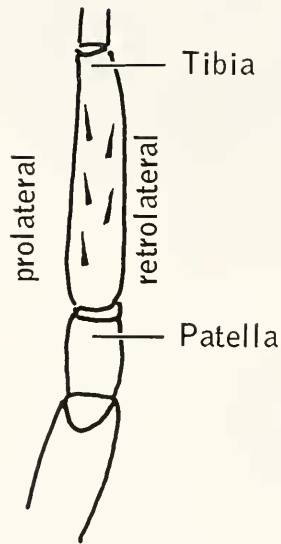


Fig. 5. Tibia I ventral spination: 3-2.

Spination. The legs are usually quite spiniferous, but the number and positions of the spines are relatively variable within a species. The ventral spination of the tibia of leg I is reported because the spination is fairly constant, easily observable, and often useful in distinguishing between species or species-groups. Of the two numbers in the notation (e.g., see Fig. 5), the first represents the prolatateral ventral spines and the second the retrolateral ventral spines. In addition, the spines are described as weak, moderate, or strong (character of thickness), and short, moderately short, moderately long, or long.

Abdominal setae. The abdomen usually has two pairs of setae at its anterior dorsal end—an anterior, or first pair, and a posterior, or second pair (Fig. 6). The first pair is usually thinner than the second. In *Mazax* the second pair is often developed into heavy spines. The setae are described as either hairlike, very thin, thin, moderately thin, moderate, moderately stout, or stout.

Chelicerae and cheliceral teeth. The color of the chelicerae is that of its anterior

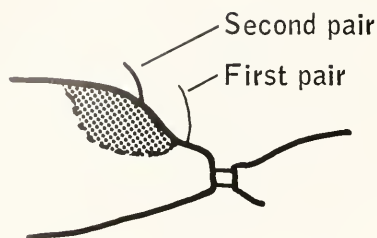


Fig. 6. Abdominal setae (lateral view of anterior abdomen).

surface and is often the same as that of the carapace. The fangs are simple, fairly heavy, and evenly curved.

The cheliceral teeth are in two rows—the promargin teeth and the retromargin teeth. The retromargin teeth are closer to the base of the fang than are the promargin teeth (Fig. 79). Sometimes there is a denticle near the distal promargin tooth. The only difference between a denticle and a small tooth is a difference in size, and it is therefore sometimes a subjective one. In most cases the denticle is clearly a tiny vestige of a functional tooth.

In a few small species of *Castianeira* the apical setae on the promargin of the chelicerae are thickened and serrated, forming a "rake" or heavy claw (Figs. 267, 270, 273).

Eyes. Curvature of the eye rows is determined by observing the carapace dorsally. In recurved row of eyes, the medial eyes are anterior to the lateral eyes; in a procurved row, the medial eyes are posterior to the lateral eyes.

ILLUSTRATIONS

The illustrations were made under a microscope, using different magnifications— $15\times$ for cephalothoraxes, abdomens, and some other large parts, $90\times$ for male and female genitalia and eyes, and $216\times$ for embolus tips. The scales of the illustrations for each magnification are constant, thereby facilitating direct comparisons of all homologous structures.

The male and female genitalia of each species are drawn showing (1) the ventral

aspect of the male pedipalp and usually the details of the tip of its embolus and (2) an external and internal view of the epigynum (the latter illustration showing the structure cleared in clove oil). No attempt was made to indicate hirsuteness or spination in these drawings.

The abdomens are drawn schematically in Plates IV, VI, IX, XII, XIV, and XIX. The different shadings represent relative hair or pigment colors, with white generally representing either white hair or light pigmentation, grey representing brown, black, or dark hair or dark pigmentation, and horizontal stripes representing yellow, orange, or red-orange hairs or pigmentation. These figures are merely aids to the descriptions and should be used in conjunction with them.

SYSTEM OF CLASSIFICATION

A major objective of this study is the design of a classification that is both natural and highly utilitarian. The emphasis on utility is reflected in a conservative approach to nomenclature and in the use of a simple hierarchy. Within the sub-family, only the categories genus and species are used, with the species arranged in species-groups that reflect their obvious relationships. The use of many categories to illustrate better the relationships among taxa may be very praiseworthy, but is also very risky, especially considering the "immortal" quality of the family-group, genus-group, and species-group names proposed. Only a careful and exhaustive study of an extremely well-collected group (such as the birds or mammals) over its complete range might usefully employ the many categorical subdivisions.

A hierarchy utilizing subfamily, tribe, genus, subgenus, species, and subspecies could be applied to this revision (for instance, the *cinctus* species-group of the *Castianeira* could be considered a subgenus, or the two forms in the variation of *Castianeira cubanus* could be given sub-

specific names), but it would have the weakness of depending on relatively incomplete collections from but a part of the taxon's distribution (in this case a clearly monophyletic, world-wide subfamily). The classification in this revision is both stable and flexible. No restrictive pigeon holes have been created that will hinder future work with the more complete and extensive collections that will be made. The relationships between the taxa studied are stated without petrifying the classification with tribal, subgeneric, and subspecific names.

RECORDS

The complete records for each species are included in the thesis form of this revision (Reiskind, 1967). If the species is widespread, only a general description of its distribution and a map are presented here; if it is more restricted, more specific distribution records are added.

ACKNOWLEDGMENTS

I wish first to thank Dr. Herbert W. Levi of the Museum of Comparative Zoology for his continuous help and encouragement.

The excellent collections in the Museum of Comparative Zoology and the American Museum of Natural History have been invaluable; I would like to thank Dr. Willis J. Gertsch and Mr. W. Ivie of the latter institution for their assistance and for making available to me the excellent collections that they have made over the past thirty years. I am very grateful for the loan of the personal collections of the late Dr. H. Exline (Mrs. D. L. Frizzell), Mr. Vincent D. Roth, and Mr. William B. Peck, which have proved especially valuable. I also wish to thank the following museums (and their curators) for the generous loans of type material used in this work: American Museum of Natural History (Dr. Willis J. Gertsch), the United States National Museum (Dr. Ralph Crabill), the British Museum (Natural History) (Dr. G. O. Evans and Mr. D. Clark), Institut Royal des

Sciences Naturelles de Belgique in Brussels (Mr. J. Kekenbosch), the Muséum National d'Histoire Naturelle in Paris (Dr. M. Vachon), the University Museum in Oxford (Dr. G. C. Varley), Senckenbergische Naturforschende Gesellschaft in Frankfurt (Dr. Otto Kraus), the Ohio State University Collection (Dr. C. Triplehorn), and the Kansas State University Collection (Dr. C. Rettenmeyer).

Generous financial support from Harvard University (scholarships and teaching assistantships), the National Science Foundation (graduate fellowships), and the Evolutionary Biology Committee of the Biology Department of Harvard University permitted me to devote my time to this study both at Harvard and in the field. In addition, National Institute of Health grant AI-01944 helped defray some expenses, including part of the publication costs.

I want to thank the Instituto Interamericano de Ciencias Agrícolas in Turrialba, Costa Rica, and Mr. J. Erickson, the Assistant Director at that time, for the hospitality and excellent facilities made available to me during the summer of 1965. Mr. Vincent D. Roth gave me great assistance during my stay at the Southwestern Research Station during the summer of 1966.

Finally, I would like to thank Miss Alice Bliss, Mrs. Valorie Scott, and Mr. and Mrs. Donald Farish for their assistance in the completion of this revision; and Julia B. Reiskind, who gave immeasurable help.

TAXONOMY

Subfamily **CASTIANEIRINAE** new subfamily

Type-Genus. *Castianeira* Keyserling 1879.

Characteristics. Two rows of eyes, the posterior row wider than the anterior row; the posterior eyes about equal; the median eyes of the anterior row slightly smaller to much larger than the lateral eyes.

Endites truncated at apex with no depression or constriction in the middle of their ventral faces.

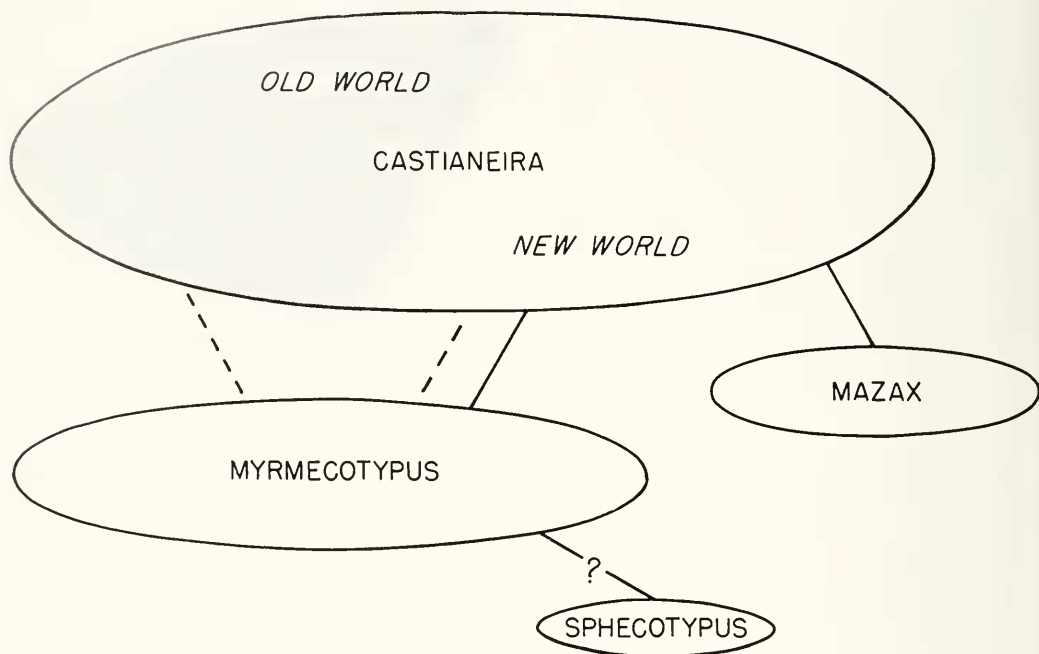


Diagram 1. Origins of the North and Central American Castianeirinae. The solid lines indicate the probable origins, while the dashed lines suggest the possible polyphyletic origins of *Myrmecotypus*.

Carapace and abdomen hairless or covered with simple and plumose hairs but never with iridescent scales.

Female genitalia with a simple pair of epigynal openings; bursae copulatrices leading to heavily sclerotized spermathecae.

Male pedipalp with a large cymbium completely covering the dorsal portion of the genital bulb. The genital bulb with a globular base and always somewhat extended anteriorly with an embolus at its distal end. Palpal duct pattern of one or more loops in the basal portion of the genital bulb.

Anterior spinnerets conical (never cylindrical) and adjacent to one another.

Leg length order usually 4 1 2 3 but sometimes 4 1 3 2.

Distribution. World-wide but predominantly tropical and subtropical.

Diagnosis. Members of this subfamily differ from other members of the Clubionidae in their distinctive male pedipalp

and simple epigynal structure. Another distinctive character is the shape of the endites.

Discussion. Justification for the proposal of a new subfamily has been outlined in *Reclassification of the Micariinae*, p. 164.

From the North and Central American representatives of this subfamily, it appears that *Castianeira* is a large, generalized group and that the other genera are specialized groups derived from *Castianeira*. The relationships of the genera in this study (see *Phylogenetic Relationships of the Genera*, p. 167) are summarized in Diagram 1.

KEY TO NORTH AND CENTRAL AMERICAN GENERA OF CASTIANEIRINAE

- 1a. Abdomen with a distinct, rugose abdominal petiole (Fig. 285); anterior eyes approximately equal or anterior median eyes smaller than laterals *Mazax*
- 1b. Abdomen with a negligible petiole; anterior eyes approximately equal or anterior median eyes larger than laterals 2

- 2a. Thoracic groove absent (often a depression present); anterior median eyes much larger than anterior lateral eyes 3
- 2b. Thoracic groove present; anterior median eyes approximately equal to or slightly larger than anterior lateral eyes
..... *Castianeira* (except *C. trimac*)
- 3a. Narrow carapace (carapace index less than 60); posterior eyes recurved
..... *Myrmecotypus* or *Sphecotypus*
- 3b. Wide carapace (carapace index greater than 60); very small; posterior eyes procurved *C. trimac*

Castianeira Keyserling

Castianeira Keyserling, 1879, Verhandl. Zool. Botan. Ges. Wien 29:334–335, pl. 4, fig. 28, ♂. Type-species by monotypy: *Castianeira rubicunda* Keyserling, *op. cit.*, 29:335–336, pl. 4, fig. 28, ♂, from New Grenada, northern South America; in the British Museum (Natural History).

Micariaulax Becker, 1879, Ann. Soc. Entomol. Belgium 22:82, pl. 2, figs. 9, 10, ♂. Type-species by monotypy: *Micariaulax dugesii* Becker, *op. cit.*, 22:83, pl. 2, figs. 9, 10, ♂, from Guanaajuato, Mexico; in the Brussels Museum, examined.

Tylophora Pavesi, 1880, Ann. Mus. Civ. Genova 15:344–345, ♂, ♀. Type-species by monotypy: *Tylophora antinorii* Pavesi, *op. cit.*, 15:345–347, ♂, ♀, from Ludien near Tozer [Tozeur], Tunisia; in the Genoa Museum.

Thargalia Karsch, 1880, Z. Ges. Naturwiss. 53: 376. Type-species: *Thargalia memnonia* (C. L. Koch).

Geotrechia Emerton, 1889, Trans. Connecticut Acad. Sci. 8(9):168–169. Type-species: *Geotrechia crocata* (Hentz) (see synonymies of *Castianeira descripta*).

Pedo O. P.-Cambridge, 1896, Biol. Centrali-Americana Arachnida 1:219, pl. 26, fig. 14, ♀. Type-species by monotypy: *Pedo ornatus* O. P.-Cambridge, *op. cit.*, 1:220, pl. 26, fig. 14, ♀, from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined.

Characteristics. Two rows of eyes, the posterior row slightly wider than the anterior row; anterior row moderately recurved, the posterior row moderately to slightly procurved; eyes approximately equal but often with anterior median eyes larger than anterior lateral eyes.

Thoracic groove usually present, often strong. Cephalic region of carapace moder-

ately narrow (cephalic width index 47–73, with *C. cubana* accounting for the values over 67).

Tibia I ventral spination 3–3 or less. Trochanter IV notch often present and deep.

Wide range of lengths (carapace length 1.10–5.40 mm) with a carapace index of 54–76 (moderate to wide).

Distribution. Cosmopolitan.

Discussion: The original description of *Castianeira* (Keyserling, 1879) was much more limited in its scope than the one above. The genus is based on a species (*C. rubicunda* Keyserling) closely related to *C. memnonia*, and the generic description specifically mentions that the legs are “slender and spiny” and “the anterior median eyes are considerably larger than the other, rather equal, ones.” Since that time the generic limits have been considerably broadened.

Castianeira is a generalized genus. In possessing general characters of carapace shape, thoracic groove, and eye arrangement, it seems to be the group from which many of the more bizarre genera have arisen—e.g., *Mazax* and *Myrmecium*. Within this large, diversified genus in North and Central America certain relationships can be seen. The species groups are the products of the most obvious relationships.

Three species groups in the North American fauna—the *longipalpus*, *amoena*, and *descripta* groups—fall into one major group, with *C. trilineata* and *C. cingulata* set far apart from them, though perhaps close to one another. The *dugesii* and *athena* groups are mainly restricted to the desert region of southwestern U. S. and northern Mexico, and the *dorsata* group resembles the main U. S. forms, though their genitalia are somewhat different.

The *dubia*, *alba*, *similis*, and *memnonia* groups are strictly neotropical; they have large anterior median eyes, and many members are highly modified for mimetic resemblances to ants. The four groups are genitally quite different from one an-

other, and the determination of relationships is further complicated by their convergence because of selection for mimicry.

The *cubana* and *cincta* groups are small spiders, all with fairly typical genitalia, the *cincta* group having a heavy "rake" on each of the chelicerae. The relationships of these two groups are not clear.

MISPLACED AND DOUBTFUL SPECIES

Castianeira arizonica Gertsch, 1942, Amer. Mus. Novit. 1195:8, immature ♀, from Phoenix, Arizona; in the American Museum of Natural History, examined = *Micaria arizonica* (Gertsch).

Species whose types were not available and whose descriptions are insufficient for recognition:

Corinna tricolor C. L. Koch, 1842, Die Arachniden 9:24, fig. 707, ♀, from Pennsylvania. This species resembles a *Castianeira crucigera* with a posterior red spot.

Castianeira zionis Chamberlin and Woodbury, 1929, Proc. Biol. Soc. Washington 42:139, pl. 2, fig. 5 (illustrations of plates 1 and 2 reversed), ♀, from Zion National Park, Utah; in the University of Utah Museum, lost. This species belongs to the *longipalpus* group.

KEY TO THE MALES OF CASTIANEIRA

- 1a. Embolus long and straight or slightly curved (male genital index greater than 20); moderately large (carapace length 2.60–4.60 mm), with carapace and abdomen covered with hairs 2
- 1b. Embolus other than above; either shorter (male genital index less than 20) or not straight 7
- 2a. Abdomen with black horizontal hair bands and spots on bright orange hair (Fig. 85) 3
- 2b. Abdomen not as above 4
- 3a. Thin legs (leg thickness index 25–27) and long embolus (male genital index 25–26) (north central U.S.) *alteranda*, p. 206
- 3b. Stout legs (leg thickness index 32–35) and moderately long embolus (male genital index 21–24) (southern U.S.) *amocna*, p. 204
- 4a. Abdomen with a median and a posterior light spot 5
- 4b. Abdomen not as above; with white horizontal bands or white hairs on an orange sclerite 6
- 5a. Embolus very long (male genital index

- 32–38) (Fig. 139) (Mexico) *azteca* p. 234
- 5b. Embolus moderately long (male genital index 24) (Fig. 147) (El Salvador) *stylifera* p. 233
- 6a. Abdomen with about eight horizontal white hair bands (Figs. 60, 78) (eastern U.S.) *variata* p. 197
- 6b. Abdomen with an orange sclerite covered with white hairs (Mexico, Arizona) *dorsata* p. 231
- 7a. Anterior median eyes distinctly larger than anterior lateral eyes (mostly Neotropical) 8
- 7b. Anterior median eyes approximately equal to anterior lateral eyes 17
- 8a. Embolus with a low twist at tip (Fig. 206) (El Salvador) *truncata* p. 237
- 8b. Embolus not as above 9
- 9a. Carapace wide (carapace index greater than 67) 10
- 9b. Carapace moderately narrow (carapace index less than 67) 12
- 10a. Large (carapace length 2.75–3.25 mm) with a white and black hair pattern (Fig. 157) (Costa Rica, Panama) *alba* p. 242
- 10b. Small (carapace length 1.10–1.60 mm); abdominal pattern not as above 11
- 11a. Carapace yellow-brown, abdomen with a horizontal row of three spots at posterior end (Fig. 269); distinctive genitalia (Fig. 201) (Panama) *trimac* p. 256
- 11b. Carapace dark brown, abdomen with three horizontal bands of white hairs (Fig. 272); distinctive genitalia (Fig. 199) (Panama) *dentata* p. 255
- 12a. Embolus with a small conical tip (Figs. 171, 177) 13
- 12b. Embolus not as above 14
- 13a. Embolus distinctly separated from genital bulb neck (Fig. 176) (Mexico) *zembla* p. 239
- 13b. Embolus not as above (Fig. 170) (Mexico, Costa Rica, Panama) *dubia* p. 238
- 14a. Genital bulb with a complex, low, twisted embolus (Fig. 196) (Panama) *memnonia* p. 245
- 14b. Genital bulb not as above 15
- 15a. Carapace and abdomen elongated and orange (Fig. 188) (Costa Rica, Mexico) *rica* p. 240
- 15b. Abdomen short and oval (Fig. 276) 16
- 16a. Carapace bicolored (cephalic region yellow, thoracic region dark brown); genital bulb as in Fig. 214 (Panama) *guapa* p. 249
- 16b. Carapace not bicolored; genital bulb

- with an extra convolution in the main palpal duct (Fig. 218) (Cuba, Florida, Texas, Panama) *cubana* p. 247
- 17a. Reddish spot on posterior of abdomen (often extending anteriorly) 18
- 17b. No reddish spot on abdomen 21
- 18a. Embolus heavy with strong twist at tip (Fig. 43) (Florida, Cuba) *floridana*¹ p. 201
- 18b. Embolus not as above (Figs. 91, 95, 99) 19
- 19a. Longitudinal white hair band on carapace (similar to Fig. 114) (southwestern U.S.) *occidens* p. 211
- 19b. No white hair band on carapace 20
- 20a. Reddish abdominal spot extending anteriorly as a pair of large spots (Washington, Oregon) *walsinghani* p. 213
- 20b. Reddish abdominal spot but not as above (eastern U.S.) *descripta* p. 208
- 21a. Embolus with a complex terminal twist 22
- 21b. Embolus straight or with a simple terminal bend 23
- 22a. Distinctive pedipalp (Figs. 102, 103); dark brown-black carapace, strongly striped legs, and two horizontal lines on abdomen (eastern U.S.) *cingulata* p. 221
- 22b. Distinctive pedipalp (Fig. 110); orange or brown carapace, three horizontal bands on abdomen (eastern U.S.) *trilineata* p. 219
- 23a. Abdomen dark with a pattern of black and white plumose hairs (often in horizontal white stripes) 24
- 23b. Abdomen with no such hairs 30
- 24a. Longitudinal band of white hairs at posterior end of abdomen (often extending anteriorly) 25
- 24b. Horizontal band of white hairs at posterior end of abdomen (*longipalpus* group, part) 26
- 25a. Abdominal pattern with a wide longitudinal white hair stripe with two black spots along median (Fig. 86) (southern U.S.) *crucigera* p. 214
- 25b. Abdominal pattern with a series of wide white hair stripes (eastern U.S.) *vulnera* p. 216
- 26a. Abdomen with separate white hair bands (Fig. 50) (northern and eastern U.S.) *longipalpus* p. 186
- 26b. Abdomen not as above 27
- 27a. Abdomen with two horizontal white hair bands connected by a longitudinal median stripe (Fig. 76) (California, Oregon) *thalia* p. 192
- 27b. Abdomen not as above 28
- 28a. Abdomen with two anterior horizontal white hair stripes (connected), then a pair of white hair spots, then a median horizontal white hair band (Fig. 55) (southwestern U.S.) *luctifera* p. 190
- 28b. Abdomen not as above 29
- 29a. Abdomen with the two anterior white hair bands (connected) followed by several other bands (Fig. 80) (Maryland) *alata* p. 188
- 29b. Abdomen with a series of white hair bands connected along median line (Mexico) *plorans* p. 195
- 30a. Abdomen yellow at anterior end darkening to dark brown at posterior end (eastern U.S.) *gertschi* p. 217
- 30b. Abdomen not as above 31
- 31a. Carapace very wide (carapace index greater than 70), small (carapace length 1.25–1.45 mm); distinctive genitalia (Fig. 192) (Panama) *cincta* p. 253
- 31b. Carapace narrower (carapace index less than 70) 32
- 32a. Embolus thin and straight (Figs. 132, 175, 211) 33
- 32b. Embolus not as above, with a terminal bend (Figs. 126, 128) 35
- 33a. Abdomen with a distinctive pigment pattern (Fig. 149) (southwestern U.S. and northern Mexico) *nanella* p. 225
- 33b. Abdomen not as above 34
- 34a. Carapace bicolored with a dark brown cephalic region and orange-brown thoracic region (Arizona) *rothi* p. 229
- 34b. Carapace not bicolored (red-brown) (southern California) *athena* p. 228
- 35a. Embolus with a right angle bend at distal end (Fig. 128) (northern Mexico) *dugesii* p. 223
- 35b. Embolus with a bend less acute (about 45°) (Fig. 126) (southern California) *alfa* p. 226

KEY TO THE FEMALES OF *CASTIANEIRA*

- 1a. Abdomen with dense plumose hair (white, black, yellow to red-orange); eyes approximately equal; moderate to large size (carapace length 2.60–4.55 mm); carapace heavily covered with hairs 2
- 1b. Not as above; either without plumose hairs, and/or anterior median eyes larger than laterals, and/or very small 25
- 2a. Abdomen with a longitudinal red-orange to yellow hair band or posterior spot 3
- 2b. Abdomen not as above, with a posterior white hair band or stripe or orange and black stripes 12
- 3a. Epigynal openings very small and medi-

¹ No male of *Castianeira crocata* is known, but if found, it would probably key out to *C. floridana*.

- ally directed (Fig. 136) (Mexico and southwestern U. S.) *dorsata* p. 231
- 3b. Epigynal openings not as above 4
- 4a. Abdomen with a wide longitudinal orange to yellow abdominal band spreading to a wide posterior band (Figs. 156, 159); internal epigynum with bursae copulatrices passing over the anterior ends of the spermathecae (Figs. 137, 145) (Mexico and Central America) 5
- 4b. Not as above; a posterior spot or longitudinal band not forming a horizontal posterior band 6
- 5a. Epigynum with small openings (Fig. 146); yellow abdominal hairs (El Salvador) *stylifera* p. 233
- 5b. Epigynum with larger openings (Fig. 138); orange abdominal hairs (Mexico) *azteca* p. 234
- 6a. External epigynal openings round, small, and posteriorly directed (Figs. 89, 93, 97); internal epigynum with wide spermathecal necks (Figs. 88, 92, 96) (the *descripta* group) 7
- 6b. External epigynal openings semicircular, moderately large, and posteriorly directed (Figs. 29, 37, 41, 44); internal epigynum with narrow spermathecal necks (Figs. 28, 36, 40, 45) 9
- 7a. Longitudinal white hair band on carapace (Fig. 114) (southwestern U. S.) *occidens* p. 211
- 7b. No discernible band on carapace 8
- 8a. Abdomen with red-orange hairs extended anteriorly in two large spots (Fig. 122) (Washington, Oregon) *walsinghami* p. 213
- 8b. Abdomen with a posterior red-orange spot often extended anteriorly but not as above (eastern U. S.) (Fig. 121, Map 6) *descripta* p. 208
- 9a. Abdomen with a wide band of red-orange hairs over a black and white pattern (Fig. 75 for black and white pattern) (California) *thalia* (red form) p. 192
- 9b. Abdomen not as above 10
- 10a. Abdomen with a red-orange median spot (somewhat elongated) (Fig. 58) (Florida, Cuba) *floridana* p. 201
- 10b. Abdomen with a long red-orange band (Figs. 56, 57) 11
- 11a. Internal epigynum with straight spermathecal necks (Fig. 45) (southern U. S.) *crocata* p. 200
- 11b. Internal epigynum with spermathecal necks turned outward (Fig. 36) (Mexico) *venusta* p. 202
- 12a. Abdomen with a posterior horizontal white hair band 13¹
- 12b. Abdomen not as above; posterior longitudinal white stripe or black and orange horizontal stripes or spots 22
- 13a. Epigynal openings directed either anteriorly or laterally (Figs. 142, 161) 14
- 13b. Epigynal openings directed posteriorly (all species are in the *longipalpus* group with very similar epigyna; the species are most easily separated by abdominal pattern) 15
- 14a. Abdominal pattern of horizontal white hair bands (Fig. 152) (Mexico) *luctuosa* p. 236
- 14b. Abdominal pattern of white hairs in several divided bands (Fig. 158) (Costa Rica, Panama) *alba* p. 242
- 15a. Abdomen with two horizontal bands connected by a longitudinal median stripe (Fig. 75) (California, Oregon) *thalia* p. 192
- 15b. Abdomen not as above 16
- 16a. Abdomen with many wide horizontal bands (eastern U. S.) *variata* p. 197
- 16b. Abdomen not as above 17
- 17a. Abdomen with several separate horizontal bands, the two anterior bands and a median one dominant (Fig. 51) (eastern and northern U. S.) *longipalpus* p. 186
- 17b. Abdomen not as above 18
- 18a. Abdomen with two anterior white hair bands joined and followed by two pairs of white hair spots (Fig. 54) (southwestern U. S.) *luctifera* p. 190
- 18b. Abdomen not as above 19
- 19a. Abdomen with several horizontal white hair bands, the two anterior ones joined, then followed by a series of abbreviated bands (similar to Fig. 80) (Maryland) *alata* p. 188
- 19b. Abdomen not as above 20
- 20a. Abdomen with three horizontal bands, two anterior and one median (Fig. 82) (Mexico and southwestern U. S.) *mexicana* p. 195
- 20b. Abdomen not as above 21
- 21a. Abdomen with a short longitudinal white hair band at anterior end with a few white hair chevrons along median line (Fig. 74) (Mexico) *flebilis* p. 198
- 21b. Abdomen with a series of five or more horizontal bands (Fig. 77) (Mexico) (possibly *plorans*¹) *lachrymosa* p. 194
- 22a. Abdomen with orange and black stripes or pairs of spots of plumose hairs (Figs.

¹ Also check *C. athena*¹ Pattern on abdomen of *Castianeira plorans* is unclear, but it possibly keys out to here or has the bands somewhat connected along the median.

- 83, 84); wide bursac copulatrices (Figs. 67, 70) 23
- 22b. Abdomen with a longitudinal white hair band at posterior end (Figs. 81, 87) 24
- 23a. Legs stocky (leg thickness index 32-33) (southeastern U. S.) *amoena* p. 204
- 23b. Legs thinner (leg thickness index 24-26) (north central U. S. and south central Canada) *alteranda* p. 206
- 24a. Abdomen with a wide longitudinal white hair band with two dark spots along the midline (Fig. 87) *crucigera* p. 214
- 24b. Abdomen with a series of white hair bands (Fig. 81) *vulnerea* p. 216
- 25a. Anterior median eyes distinctly larger than the laterals 26
- 25b. Anterior eyes approximately equal 34
- 26a. Apex of chelicera with a "rake" consisting of a heavy row of prongs or one heavy claw 27
- 26b. No "rake" at apex of chelicera 28
- 27a. Apical cheliceral "rake" with four heavy prongs (Fig. 273) (Panama) *dentata* p. 255
- 27b. Apex of chelicera with a single heavy claw (Fig. 270) (Panama) *trimac* p. 256
- 28a. Abdomen with a large dorsal sclerite (covering over half of the abdomen) (Fig. 276) 29
- 28b. Abdomen with a smaller dorsal sclerite 30
- 29a. Epigynal openings directed posteriorly and laterally (Fig. 207); cephalic region narrow (cephalic width index 53-58) (Texas) *peregrina* p. 251
- 29b. Epigynal openings directed posteriorly and medially (Fig. 216); cephalic region wide (cephalic width index 64-73) (Cuba, Panama) *cubana* p. 247
- 30a. Carapace clearly bicolored with the cephalic region yellow-orange, thoracic region dark brown; carapace length 2.25-2.40 mm (Panama) *guapa* p. 249
- 30b. Carapace not bicolored 31
- 31a. Very large (carapace length 4.15-5.10 mm), with a ponerinelike abdomen with long simple hairs (Figs. 184, 185) *similis* p. 244
- 31b. Not as above; smaller (2.15-3.90 mm) 32
- 32a. Epigynal openings a pair of simple horizontal slits (Fig. 195) (Panama) *memnonia* p. 245
- 32b. Epigynal openings semicircular (Figs. 162, 169) 33
- 33a. Abdomen with a yellow-white band or spot at posterior end (Fig. 182) (Mexico, Central America) *dubia* p. 238
- 33b. Abdomen with no posterior light band or spot (Fig. 189) (Costa Rica, Mexico) *rica* p. 240
- 34a. Small (carapace length 1.50-1.65 mm) with a row of heavy serrated spines at apex of chelicera (Fig. 267) (Panama) *cincta* p. 253
- 34b. Not as above, larger with no cheliceral apical "rake" 35
- 35a. Epigynal openings flared and directed posteriorly (Figs. 101, 105, 109, 124, 130) 36
- 35b. Epigynal openings small and round (Figs. 173, 209, 211) 40
- 36a. Posterior half of abdomen predominantly brown-black with a clear-cut division between light and dark areas (Figs. 150, 151) (southwestern U. S.) 37
- 36b. Not as above, no clear-cut dark posterior half, usually having two or three light horizontal stripes 38
- 37a. Epigynum and abdominal pattern as illustrated (Figs. 129, 130, 150) (southwestern U. S.) *nanella* p. 225
- 37b. Epigynum and abdominal pattern as illustrated (Figs. 123, 124, 151) (southern California) *alfa* p. 226
- 38a. Fairly small (carapace length 2.35-2.85 mm) with an abdomen that darkens posteriorly from yellow at anterior end to dark brown at posterior, often with two or three light horizontal bands (eastern U. S.) *gertschi* p. 217
- 38b. Not as above, abdomen single ground color 39
- 39a. External epigynum extremely flared with a horizontal opening (Fig. 101); two thin light horizontal bands on abdomen (Fig. 118); strongly striped legs (eastern U. S.) *cingulata* p. 221
- 39b. External epigynum flared (Fig. 109) with two or three light horizontal bands on abdomen (eastern U. S.) *trilineata* p. 219
- 40a. Carapace covered with white hairs and abdomen with a distinctive pattern of hairs (Fig. 279); epigynal openings directed laterally (Fig. 221) (Panama) *abuelita* p. 250
- 40b. Not as above, with no heavy white hair covering 41
- 41a. Carapace usually bicolored (darker cephalic region), and moderately small, round epigynal openings (Fig. 209) (Arizona) *rothi* p. 229
- 41b. Carapace never bicolored, and very small, round epigynal openings (Fig. 173) (southern California) *athena* p. 228

THE LONGIPALPUS GROUP

Characteristics. Moderately large (male carapace length 2.50-3.70 mm; female carapace length 2.50-3.70 mm); female carapace length 2.50-3.70 mm; female carapace length 2.50-3.70 mm;

pace length 2.75–4.55 mm), with carapace index 63–73. Abdomen completely covered with plumose hairs, often in a black and white striped pattern but sometimes with a red-orange spot or longitudinal stripe. Spermathecae characterized by globose anterior ends, thin posterior necks, and narrow bursae copulatrixes. Male genital index 18 or below (with the exception of *Castianeira variata*). Fairly stocky, with the leg thickness index of the females 27–33. Eyes moderately small and equal.

Discussion. This is the largest of the species groups in *Castianeira* and is distributed from Canada to central Mexico. Two subgroups can be distinguished: (1) *C. longipalpus*, *C. alata*, *C. luctifera*, *C. thalia*, *C. lachrymosa*, *C. mexicana*, *C. plorans*, *C. variata*, and *C. flebilis*, and (2) *C. crocata*, *C. floridana*, and *C. venusta*. The first group has white hair bands on the abdomen and fairly thin spermathecal necks; the second has a red-orange band or spot on the abdomen and similar spermathecae.

Hentz (1847) notes that the spots and bands in this species group “. . . are produced by hairs which are quite deciduous, and hence there are many varieties of markings.” For this reason and because of the diagnostic importance of the patterns in this group, many specimens are difficult to identify. The banding on the abdomen of spiders reflects their embryonic segmentation (Crome, 1955). The basic pattern, as seen in *Castianeira longipalpus* (Fig. 51), consists of five major horizontal bands: I and II at the anterior end, followed by an often incomplete band III and a strong median band IV, with a final posterior band, P. There are often some minor bands or pairs of spots between bands IV and P. This hair pattern is also observed in other groups—e.g. *C. alba* and *C. dubia*.

This group is apparently quite complex and widespread in Mexico, but small collections and the fragility of the abdominal patterns have prevented proper study of the Mexican members of the group.

Castianeira longipalpus (Hentz)

Frontispiece. Figures 7–10, 50–53. Map 1.

Herpyllus longipalpus Hentz, 1847, Boston J. Nat. Hist. Soc. 5:457, pl. 24, fig. 9, ♀, from Alabama; lost.

Agroeca tristis Keyserling, 1887, Verhandl. Zool. Bot. Ges. Wien 37:436, pl. 6, fig. 11, ♀, from Maryland; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

Geotrecha pinnata Emerton, 1889, Trans. Connecticut Acad. Sci. 8(9):170, fig. 4, ♂, ♀. Female cotypes from Topsfield, Massachusetts; in the Museum of Comparative Zoology, examined.

Thargalia longipalpus: Marx, 1889, Proc. U. S. Nat. Mus. 12:513.

Thargalia pinnata: Marx, 1889, Proc. U. S. Nat. Mus. 12:514.

Thargalia perplexa Banks, 1892, Proc. Acad. Nat. Sci. Philadelphia 1892:15, pl. 1, fig. 53, ♀, from Ithaca, New York; in the Museum of Comparative Zoology, examined.

Corinna media Banks, 1896, Trans. Amer. Entomol. Soc. 23:66, penultimate ♂, from Olympia, Washington; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

Corinna pacifica Banks, 1896, Trans. Amer. Entomol. Soc. 23:66. One male and two female syntypes from Olympia, Washington; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

Castianeira longipalpus: Banks, 1910, Bull. U. S. Nat. Mus. 72:11. Chickering, 1939, Pap. Michigan Acad. Sci. 24(2):60, figs. 24–27, ♂, ♀. Kaston, 1948, Connecticut Geol. and Nat. Hist. Surv. Bull. 70:398, figs. 1403, 1411, 1427, ♂, ♀.

MALE

Measurements. Based on 24 males: carapace length 2.50–3.50 mm; carapace width 1.75–2.40 mm; carapace index 68–73; sternum length 1.05–1.50 mm; sternum width 0.90–1.20 mm; sternum index 77–86.

Femur IV length 1.85–2.65 mm; femur IV width 0.45–0.75 mm; leg thickness index 25–29; leg length index 70–78.

Embolus length 0.13–0.18 mm; bulb length 1.04–1.50 mm; male genital index 11–13.

Description. Carapace red-brown, covered with plumose white hairs; some black and white hairs predominant in head region. Carapace narrow in head region (cephalic width index 47–49) and smoothly truncated

anteriorly. Ocular region darker. Thoracic groove strong.

Abdomen elongated oval, with almost complete, dark red-brown, dorsal sclerite; covered with dense black and white plumose hairs in four main horizontal white hair bands in same pattern as in female (Fig. 50). Epigastric sclerite orange-brown. Elongated rectangular ventral sclerite from epigastric furrow almost to a small inframamillary sclerite, both red-brown and covered with simple black hairs. Both pairs of abdominal setae very thin.

Sternum dark red-brown, shield-shaped, with sparse, thin setae, heavier setae near edges. Pedicel very short.

Chelicerae brown, with two moderate retromargin teeth and two promargin teeth, the distal one large and the proximal one moderate. A small distinct denticle just distal and medial to the larger promargin tooth.

Coxae all light brown. Trochanter IV with small notch.

Femora of all legs red-brown; rest of legs I and II yellow; of leg III light red-brown; and of leg IV dark red-brown; both ends of tibia IV, and tarsus IV, lighter. Legs moderately hirsute, with black and white hair pattern on femora III and IV and narrow white hair bands at both ends of tibia IV. Tibia I ventral spination: 2-2, moderate, proximal retrolateral spine smaller.

Pedipalp with blunt, short, retrolateral tibial apophysis. Tarsus with globose genital bulb drawn out into long neck with straight, stout, heavily sclerotized embolus with distinct spiral twist at tip (Figs. 9, 10).

FEMALE

Measurements. Based on 34 females: carapace length 2.75-4.00 mm; carapace width 1.85-2.65 mm; carapace index 66-71; sternum length 1.20-1.75 mm; sternum width 1.05-1.40 mm; sternum index 74-89.

Femur IV length 2.15-3.10 mm; femur

IV width 0.60-0.85 mm; leg thickness index 26-30; leg length index 74-81.

Description. Carapace dark red-brown, with short, slightly plumose black and white hairs, white hairs predominant in head region. Carapace narrow in head region (cephalic width index 55-58) and smoothly truncated anteriorly (Fig. 53). Ocular region darker. Eyes moderately small and equal (Fig. 52). Thoracic groove strong.

Abdomen oval, with small, rounded, red-brown, anterior dorsal sclerite; covered with a black and white pattern of dense hairs on a grey background in four main horizontal white hair stripes—two anterior, the third midway, and the fourth at the posterior end of the abdomen—with several additional narrower bands, one between the second and third main bands and two between the third and posterior bands (Fig. 51). Epigastric sclerite red-brown. Four light, thin, beaded stripes running from epigastric furrow to posterior spiracular furrow, the median two parallel and arising posterior to epigynal openings and laterals from sides of epigastric furrow. Both pairs of abdominal setae very thin.

Sternum red-brown, shield-shaped, with sparse, thin setae. Pedicel very short.

Chelicerae brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal smaller than the retromargin teeth. A small, distinct denticle just distal and medial to the larger promargin tooth.

Coxae all light brown. Trochanter IV with a small notch.

Femora of all legs red-brown; rest of legs I and II yellow; of leg III light red-brown; and of leg IV dark red-brown; both ends of tibia IV, and tarsus IV, lighter. Legs moderately hirsute, with black and white hairs on femora III and IV and white hair bands at both ends of tibia IV. Tibia I ventral spination: 2-2, moderate, proximal retrolateral spine smaller.

External epigynum with heavily sclero-

tized borders to the flared openings (Fig. 8). Internal structure heavily sclerotized, with large bulbed spermathecae narrowing posteriorly to a fairly long, narrow, straight neck (Fig. 7).

Diagnosis. *Castianeira longipalpus* differs from other species in the *longipalpus* group in its distinctive abdominal pattern (Figs. 50, 51), short, thick embolus (Fig. 10), and small epigynal openings (Fig. 8). *Castianeira luctifera* and *C. thalia* both have a male genital index of less than 14, but their abdominal patterns are distinct from those of *C. longipalpus*.

Remarks. *Castianeira longipalpus* is the most widespread of the American *Castianeira*. There is a fairly large variation in size, with the northern specimens (Ontario) generally smaller than the southern specimens (New York, Kentucky, Illinois).

Natural history. *Castianeira longipalpus* has been found inhabiting the leaves on the floor of beech-maple forest in Virginia (Elliott, 1930), under dead leaves in dry places on Long Island (Banks, 1895), on the ground, under stones in the prairie of Oklahoma (Banks, Newport, and Bird, 1932), and abundantly in shaded places in the woods of Massachusetts (Montgomery, 1909). Small, immature specimens were found on herbs but larger ones on the ground in the East Central Illinois forest (Jones, 1941). It is also found in the black oak and beech-maple forests of the Chicago area dunes (Lowrie, 1948).

Reproduction probably occurs in early summer (Jones, 1941). Montgomery (1909) observed copulation in *C. longipalpus*. The male mounts the female over her head. "In copulation the male stands over the female, his ventral surface opposed to her dorsal, their body axes obliquely inclined, his head a little to one side of the anterior end of her abdomen. One palpus is inserted at a time." The male mates several times, and the female accepts more than one mate.

The egg case or cocoon is white and dislike. Montgomery (1909) describes the

cocoon construction in detail. The female first spins a cocoon base, sweeping her spinnerets slowly from side to side. Onto this base she discharges from her genital aperture a clean globule of viscous liquid, and in this liquid discharges several large eggs. The cover is produced first by carrying thread from the edge of the base onto and across the egg mass and then, after ten minutes, brushing the spinnerets over the surface. The surface is covered with small debris, probably due to its initially slightly sticky surface or some salivary secretion. An identical cocoon-making operation was observed, by the author, in *Mazax pax* in Costa Rica. Montgomery (1909) reports five cocoons of *C. longipalpus* found, two with eight eggs in them and three with nine.

C. longipalpus is found mature in late summer in New England (see *Remarks* under *C. variata*). In western Tennessee it hatches in the last half of August and matures the next year in late June (Gibson, 1947).

Montgomery (1909) observes the resemblance of this species to "the macroergates of a large mound-building ant," finding some of the spiders most abundant within twenty feet of one such nest. He has shown that the ants are not deceived by the spiders, killing them when placed with them. Hentz (1847) merely states that they move with the "rapidity of lightning."

Distribution. Eastern and northern U. S. and southern Canada (Map 1).

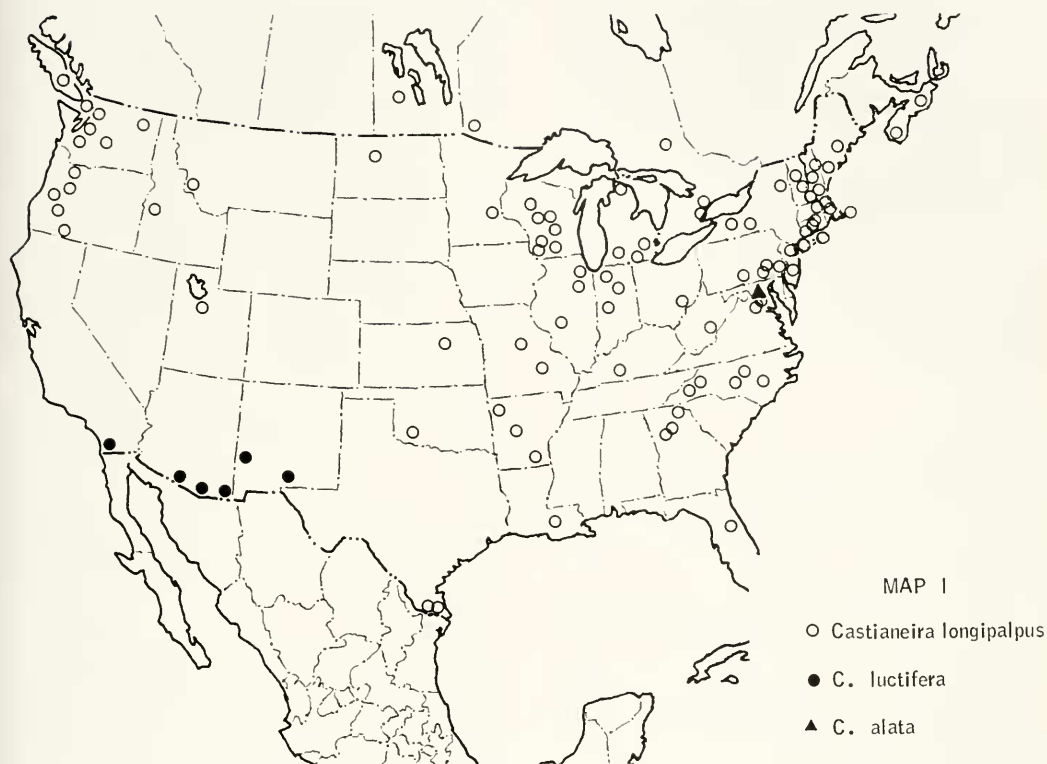
Castianeira alata Muma

Figures 15–18, 80. Map 1.

Castianeira alata Muma, 1945, Proc. Biol. Soc. Washington 58:97, pl. 10, figs. 11–13, ♂, ♀. Male holotype from Berwyn, Maryland; in the American Museum of Natural History, examined.

MALE

Measurements. Based on holotype and one male, holotype listed first, range of both follows: carapace length 2.60 mm, 2.60–2.80 mm; carapace width 1.85 mm,



1.85–2.05 mm; carapace index 70, 70–72. Based on holotype only: sternum length 1.30 mm; sternum width 0.95 mm; sternum index 75.

Femur IV length 2.10 mm, 2.10–2.15 mm; femur IV width 0.55 mm, 0.55–0.60 mm; leg thickness index 26, 26–28; leg length index 80, 77–80.

Abdomen length 2.85 mm, 2.85–2.90 mm; abdomen width 1.55 mm, 1.25–1.55 mm; abdomen index 54, 43–54.

Based on one male, not the holotype: embolus length 0.19 mm; bulb length 1.17 mm; male genital index 16.

Description. Carapace red-brown, with white hairs. Eyes small and about equal. Carapace narrower in head region (cephalic width index 48–51) and smoothly truncated anteriorly. Thoracic groove fairly strong.

Abdomen elongated oval, with an almost

full, red-brown dorsal sclerite and a white hair pattern—two wide horizontal bands (widening medially and connecting along median), a small horizontal spot, a horizontal chevronlike band, followed by at least two narrower bands and a posterior band (Fig. 80). Epigastric sclerite red-brown. Red-brown ventral sclerite rectangular from epigastric furrow to spiracular furrow. Anterior pair of abdominal setae hairlike, posterior pair thin.

Sternum red-brown. Pedicel negligible.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a small denticle just distal and median to the distal promargin tooth.

Coxa I orange-brown, coxae II, III, and IV light yellow-brown. Trochanter IV notch moderately deep.

Femora red-brown (yellow at distal ends). Rest of legs I and II light yellow; rest of leg III yellow, but tibia darker in center and light at ends; rest of leg IV red-brown, with ends of tibia and the tarsus dark yellow. Legs moderately hirsute. Tibia I ventral spination: 2-2, moderately small.

Pedipalp with a strong, blunt tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a straight, thick embolus having a twist at its tip (Figs. 17, 18).

FEMALE

Measurements. Based on one female: carapace length 3.45 mm; carapace width 2.25 mm; carapace index 65; sternum length 1.55 mm; sternum width 1.20 mm; sternum index 79.

Femur IV length 2.60 mm; femur IV width 0.70 mm; leg thickness index 27; leg length index 76.

Abdomen length 4.60 mm; abdomen width 2.65 mm; abdomen index 58; dorsal sclerite width 1.00 mm.

Description. Carapace red-brown, with white hairs. Eyes small and about equal. Carapace narrower in head region (cephalic width index 56) and smoothly truncated anteriorly. Thoracic groove fairly strong.

Abdomen elongate oval, with a small, red-brown dorsal sclerite and a white and brown-black hair pattern—two wide horizontal white bands (connected along median), a small median white spot, five white chevrons decreasing in size posteriorly, and a wide posterior band of white hairs (a total of 9 bands—easily rubbed off). The two wide white hair bands continue onto sides of abdomen. Ventral area with two longitudinal beaded stripes from sides of epigastric furrow to spiracular furrow. Epigastric sclerite orange-brown. Anterior pair of abdominal setae hairlike, posterior pair very thin.

Sternum orange-brown, with thin, sparse setae. Pedicel very small.

Chelicerae red-brown, with two mod-

erate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a small denticle just distal and median to the distal promargin tooth.

Coxa I light red-brown, coxae II, III, and IV light yellow-brown. Trochanter IV notch moderately deep.

Femora red-brown (yellow at distal ends). Rest of legs I and II light yellow; rest of leg III yellow-brown; rest of leg IV red-brown, with both ends of tibia yellow (reinforced with white hairs) and tarsus yellow-brown. Legs moderately hirsute. Tibia I ventral spination: 2-2, moderately small.

External epigynum with flared openings having sclerotized edges (Fig. 16). Internal structure with extremely globose spermathecae narrowing to thin necks posteriorly (Fig. 15).

Diagnosis. *Castianeira alata* differs from other species in the *longipalpus* group in its distinctive abdominal pattern and male genitalia (the embolus fairly thick, with male genital index 16).

Remarks. This species, one of the large *longipalpus* group, is found only in Maryland, the most restricted distribution of any *Castianeira* in the United States.

Natural history. "Two specimens were found in a house; two under leaves on the ground" (Muma, 1945).

Distribution. Maryland (Map 1).

Records. Maryland. Montgomery Co.

Castianeira luctifera Petrunkevitch

Figures 11-14, 54, 55. Map 1.

Thargalia luctuosa Banks, 1901, Proc. U. S. Nat. Mus. 23:584, pl. 22, fig. 1, ♀, from Santa Rita Mountains, Arizona; in the United States National Museum, examined. (Preoccupied by *Castianeira luctuosa* O. P.-Cambridge, 1898.)

Castianeira luctuosa: Banks, 1910, Bull. U. S. Nat. Mus. 72:11.

Castianeira luctifera Petrunkevitch, 1911, Bull. Amer. Mus. Nat. Hist. 29:454 (nomen novum for *T. luctuosa* Banks, 1901).

MALE

Measurements. Based on 10 males: carapace length 2.55–2.95 mm; carapace width 1.75–2.05 mm; carapace index 68–71; sternum length 1.10–1.30 mm; sternum width 0.95–1.10 mm; sternum index 81–92.

Femur IV length 1.85–2.30 mm; femur IV width 0.55–0.65 mm; leg thickness index 27–30; leg length index 71–80.

Embolus length 0.11–0.16 mm; bulb length 0.96–1.25 mm; male genital index 11–14.

Description. Carapace red-brown, with sparse light hairs in a median band, especially long hairs in cephalic region and on lateral edges, with some black hairs on sides of carapace. Head narrow (cephalic width index 48–52) and smoothly truncated anteriorly. Ocular area darker. Eyes moderately small and equal. Thoracic groove strong.

Abdomen long oval, with a full, dark maroon dorsal sclerite covered with black and white plumose hairs—anteriorly two broad white horizontal bands joining medially, followed by a pair of round white hair spots and then, midway on abdomen, a band of white hair; broad white hair band at posterior end of abdomen (Fig. 55). Epigastric sclerite red-brown. Rectangular red-brown ventral sclerite from epigastric furrow to a small red-brown inframammillary sclerite. Anterior abdominal setae very thin, posterior pair slightly stouter.

Sternum shield-shaped, red-brown, with sparse, short, stout setae. Pedicel short.

Chelicerae brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A small denticle just medial and distal to the larger promargin tooth.

Coxae all yellow. Trochanter IV notch small and curved.

Femora of legs I and II dark yellow, rest of I and II yellow. Femur III yellow-brown, with black and white hairs, rest of III yellow-brown, with yellow tarsi; femur

IV deep red-brown, with black and white hairs; patella IV dark red-brown; tibia IV dark red-brown, with light annuli reinforced with white hairs at both ends; metatarsus IV red-brown; tarsus IV dark yellow. Legs moderately hirsute. Tibia I ventral spination: 2–2, moderately small.

Pedipalp with blunt, short tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck, with a straight, stout, heavily sclerotized embolus having a distinct spiral twist at the tip (Figs. 13, 14).

FEMALE

Measurements. Based on holotype and 19 females, holotype listed first, range of all follows: carapace length 3.40 mm, 2.75–3.65 mm; carapace width 2.25 mm, 1.85–2.40 mm; carapace index 66, 63–70; sternum length 1.60 mm, 1.25–1.65 mm; sternum width 1.30 mm, 1.05–1.30 mm; sternum index 82, 77–84.

Femur IV length 2.50 mm, 1.95–2.60 mm; femur IV width 0.75 mm, 0.60–0.80 mm; leg thickness index 30, 28–32; leg length index 73, 70–77.

Based on holotype alone: abdomen length 4.30 mm; abdomen width 2.65 mm; abdomen index 61; dorsal sclerite length 0.95 mm; dorsal sclerite width 1.20 mm; dorsal sclerite index 126.

Description. Carapace red-brown, with sparse light hairs in broad median band, especially long hairs on head region, and with some black hairs on sides of lateral edges. Head narrow (cephalic width index 53–58) and smoothly truncated anteriorly. Ocular area darker. Eyes moderately small and equal. Thoracic groove strong.

Abdomen oval, with a small, red-brown anterior dorsal sclerite. Black and white plumose hair pattern—anteriorly two broad white horizontal bands joining medially, followed by a pair of round white hair spots and then, midway on abdomen, a pair of oval white hair spots; broad white hair band at posterior end of abdomen (Fig. 54). Epigastric sclerite red-brown. Four

light pigmented, thin, beaded stripes running from epigastric furrow to a small orange-brown inframammillary sclerite, the median two parallel and intermittently arising posterior to epigynal openings, and the laterals parallel and cleanly arising from sides of epigastric furrow. Abdominal setae very thin.

Sternum shield-shaped and red-brown, with sparse, long setae. Pedicel short.

Chelicerae red-brown, with two moderate retromargin teeth, the distal one slightly larger, and two promargin teeth, the distal one larger and the proximal one much smaller than the retromargin teeth. A small but distinct denticle just medial and distal to the larger promargin tooth.

Coxae all yellow. Trochanter IV with small curved notch.

Femora I and II dark yellow, rest of I and II yellow. Femora III and IV yellow-brown, much darker towards distal end, with some black and white hairs; rest of III yellow-brown; patella IV dark red-brown; tibia IV dark brown, with light annuli reinforced with white hairs at both ends; metatarsus IV dark red-brown; tarsus IV yellow-brown. Legs moderately hirsute. Tibia I ventral spination: 2-2, moderately strong.

External epigynum with dark circular openings (Fig. 12). Internal structure heavily sclerotized, with large, bulbed spermathecae narrowing posteriorly to a fairly short, narrow neck (Fig. 11).

Diagnosis. *Castianeira luctifera* differs from other *longipalpus* group species in its distinctive abdominal pattern (Figs. 54, 55) and external female genitalia (Fig. 12).

Remarks. This species shows relatively little sexual dimorphism except in the abdominal pattern. The abdominal pattern is a very constant character within the range of each sex of the species.

Natural history. *Castianeira luctifera* is found running over and under dead leaves in the oak forest of the Chiricahua Moun-

tains. The motions are fast and not noticeably ant-like.

The egg case is white and disc-shaped, with orange eggs. One case collected contained 14 eggs.

Distribution. Southern Arizona, New Mexico, and California (Map 1).

Records. Arizona. Cochise Co., Pima Co., Santa Cruz Co. California. San Diego Co. New Mexico. Catron Co., Otero Co.

Castianeira thalia new species

Figures 28-31, 75, 76. Map 2.

Holotype. Female from Pacific Grove, Monterey Co., California, 3-IV-1960 (W. J. Gertsch, Ivie, Schrammel); in the American Museum of Natural History. The specific name is a noun in apposition after the Muse of Comedy, Thalia.

MALE

Measurements. Based on 4 males: carapace length 2.65-2.85 mm; carapace width 1.85-2.00 mm; carapace index 68-70; sternum length 1.20-1.30 mm; sternum width 1.00-1.10 mm; sternum index 81-86.

Femur IV length 1.95-2.20 mm; femur IV width 0.55-0.60 mm; leg thickness index 24-29; leg length index 72-78.

Abdomen length 2.65-2.80 mm; abdomen width 1.50-1.80 mm; abdomen index 57-66.

Embolus length 0.13-0.14 mm; bulb length 1.12-1.20 mm; male genital index 11-12.

Description. Carapace orange, with some short, light hairs. Eyes bordered with black. Carapace narrow in head region (cephalic width index 48-49) and smoothly truncated anteriorly. Thoracic groove fairly strong.

Abdomen a long oval with a seven-eighths complete maroon dorsal sclerite with a plumose white hair pattern (somewhat rubbed off) of a median and two anterior horizontal bands, all connected by a median longitudinal band, followed by three flattened chevrons and, finally, a posterior, wide, horizontal band (Fig. 76). Epigastric sclerite dark red-brown. Wide, rectangular,

light red-brown ventral sclerite from epigastric furrow almost to dark red-brown inframamillary sclerite. Anterior abdominal setae long and very thin, posterior pair long and a bit thicker.

Sternum red-brown with sparse setae. Pedicel negligible.

Chelicerae orange-brown with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A small denticle distal and medial to the larger promargin tooth.

Coxae all yellow. Trochanter IV notch moderate.

Femora I, II and III yellow, IV dark yellow; rest of legs I and II light yellow; patella-tibia III light yellow, metatarsus and tarsus III light yellow-brown; rest of leg IV light red-brown. Legs moderately hirsute. Tibia I ventral spination: 2-2, moderately small.

Pedipalp with small blunt tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with short, straight, blunt embolus tip with a clear twist (Figs. 30, 31).

FEMALE

Measurements. Based on holotype and 6 females, holotype listed first, range of all follows: carapace length 2.95 mm, 2.90-3.40 mm; carapace width 1.90 mm, 1.85-2.20 mm; carapace index 65, 65-69; sternum length 1.30 mm, 1.30-1.50 mm; sternum width 1.10 mm, 1.10-1.20 mm; sternum index 87, 83-88.

Femur IV length 2.15 mm, 2.10-2.55 mm; femur IV width 0.60 mm, 0.60-0.75 mm; leg thickness index 28, 28-31; leg length index 74, 72-76.

Abdomen length 2.80 mm, 2.80-4.15 mm; abdomen width 1.80 mm, 1.80-2.80 mm; abdomen index 64, 58-69.

Description. Carapace yellow-brown with median longitudinal light hair band, longer hairs on head region. Eyes bordered with black. Carapace narrow in head region

(cephalic width index 54-58) and smoothly truncated anteriorly. Thoracic groove fairly strong.

Abdomen is oval with a small, red-brown dorsal sclerite and a distinctive plumose black and white hair pattern—anterior white hair spot followed by a horizontal white hair band (one fourth distance from anterior end) and another median horizontal stripe. These three areas connected by a median, longitudinal white hair band. The median horizontal stripe is followed by three median, flat chevrons and finally a wide, posterior, white hair band (Fig. 75). Rest of dorsal abdomen covered by black hairs. Epigastric sclerite red-brown. Ventral area with four faint, longitudinal, beaded stripes from epigastric furrow to small orange-brown inframamillary sclerite. Anterior pair of abdominal setae hair-like, posterior pair very thin.

Sternum light red-brown with sparse, thin setae. Pedicel negligible.

Chelicerae light brown with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A small denticle distal and medial to the larger promargin tooth.

Coxae all yellow-white. Trochanter IV notch moderately deep.

Femora of all legs very light brown with dark hairs, especially dense on femur IV. Rest of legs I and II yellow-white, of leg III very light brown, of leg IV light brown with light yellow tarsus. Legs moderately hirsute. Tibia I ventral spination: 2-2, small.

External epigynum with two large, flared openings (Fig. 29). Internal structure with globose spermathecae narrowing to moderately thin, distinct necks posteriorly (Fig. 28).

Diagnosis. *Castianeira thalia* differs from other *longipalpus* group species in its distinctive abdominal pattern.

Remarks. A single specimen of *C. thalia* from a population in Piercy, California, has a wide band of red-orange hairs overlying

the fundamental black and white hair pattern. Except for this character, the spider is typical of *C. thalia*. This may be an example of an aberrant color form, or perhaps it is part of a polymorphic complex like the one reported in *Enoplognatha ovata* (= *Theridion ovatum*) (Geyer, 1967).

Natural history. Little is known of the habits of *C. thalia*, but one specimen reportedly was collected under a rock. Probably, like most *longipalpus* group species, it prefers running over dead leaves in shade.

Distribution. California and Oregon (Map 2).

Records. *California.* Los Angeles Co., Mendocino Co., Monterey Co., San Diego Co. *Oregon.* Wallowa Co.

Castianeira lachrymosa (O. P.-Cambridge)

Figures 34, 35, 77. Map 3.

Pedo lachrymosa O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:275, pl. 34, fig. 4, ♀, from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined. *Castianeira lachrymosa*: O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:286.

Castianeira lugens O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:288, pl. 32, fig. 10, "♀." Penultimate female holotype from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined. NEW SYNONYMY.

FEMALE

Measurements. Based on one female holotype: carapace length 3.40 mm; carapace width 2.30 mm; carapace index 69; sternum length 1.50 mm; sternum width 1.25 mm; sternum index 83.

Femur IV length 2.60 mm; femur IV width 0.80 mm; leg thickness index 31; leg length index 77.

Abdomen length 3.95 mm; abdomen width 2.65 mm; abdomen index 68; dorsal sclerite width 0.95 mm.

Description. Carapace brown-maroon and covered with white hairs. Carapace moderately narrow in head region (cephalic width index 61) and smoothly truncated anteriorly. Eyes bordered in black and approxi-

mately equal. Thoracic groove moderately strong.

Abdomen oval with a small, red-brown dorsal sclerite and a dorsal brown and white hair pattern—a series of about six horizontal median white stripes ending in a posterior white hair band (Fig. 77). (Many hairs rubbed off.) Ventral abdomen light brown. Anterior abdominal setae hair-like, posterior pair extremely thin.

Sternum red-brown with fairly dense, moderately short setae. Pedicel negligible.

Chelicerae dark red-brown with two moderate retromargin teeth and two promargin teeth, the distal one slightly larger and the proximal one slightly smaller than the retromargin teeth.

Coxae all red-brown. Trochanter IV notch fairly strong.

Femora deep maroon-brown; rest of legs I and II yellow-brown; rest of leg III red-brown with distal ends of patella and tibia as well as whole tarsus yellow-brown; rest of leg IV dark red-brown with ends of tibia and the tarsi yellow-brown. Femora with some black and white hairs, legs moderately hirsute.

External epigynum with small, widely spaced openings, heavily sclerotized (Fig. 35). Internal structure with extremely globose spermathecae having posterior thin necks (Fig. 34).

Diagnosis. *Castianeira lachrymosa*, a Mexican species, differs from other *longipalpus* group species in its abdominal pattern and internal female genitalia.

Remarks. *Castianeira lugens* is an immature female and is therefore difficult to compare with mature forms, but its similarity in non-genitalic characteristics to *C. lachrymosa*, in addition to its sympatry, have led to its synonymy.

Natural history. Nothing is known of the habits or habitat of this species.

Distribution. Only known from its type locality in Guerrero, Mexico (Map 3).

Records. MEXICO. Guerrero.

Castianeira mexicana (Banks)

Figures 32, 33, 82. Map 3.

Thargalia mexicana Banks, 1898, Proc. California Acad. Sci. (3)1(7):228, pl. 13, fig. 38, ♀, from Tepic, Nayarit, Mexico; destroyed.

Thargalia gracilis Banks, 1898, Proc. California Acad. Sci. (3)1(7):229, pl. 13, fig. 29, ♀, from "no locality," presumably in Mexico; destroyed. NEW SYNONYMY.

Castianeira mexicana: F. P.-Cambridge, 1899, Biol. Centrali-Americana Arachnida 2:82.

Thargalia modesta Banks, 1901, Proc. Acad. Nat. Sci. Philadelphia 53:575, pl. 23, fig. 5, ♀, from Albuquerque, New Mexico; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

FEMALE

Measurements. Based on one female: carapace length 2.85 mm; carapace width 1.95 mm; carapace index 68; sternum length 1.30 mm; sternum width 1.10 mm; sternum index 83.

Femur IV length 2.15 mm; femur IV width 0.60 mm; leg thickness index 27; leg length index 76.

Abdomen length 2.80 mm; abdomen width 1.85 mm; abdomen index 67; dorsal sclerite width 0.85 mm.

Description. Carapace yellow-orange with light, short hair covering. Eyes small, equal, and bordered with black. Carapace narrow in head region (cephalic width index 58) and smoothly truncated anteriorly. Thoracic groove moderately strong.

Abdomen oval with a fairly small, orange, anterior dorsal sclerite and a white and brown-black hair pattern—a horizontal white hair band at anterior base, a spot on each side behind this band, a narrow horizontal white band at middle, and a white band at posterior end (Fig. 82). Epigastric sclerite light brown. Ventral abdomen with two parallel stripes from sides of epigastric furrow almost to spinnerets. Anterior abdominal setae hairlike, posterior pair very thin.

Sternum yellow-white with sparse, thin setae.

Chelicerae yellow with two moderate

retromargin teeth and two promargin teeth, the distal larger and the proximal one smaller than the promargin teeth. A very small denticle just medial and distal to the larger promargin tooth.

Coxae yellow-white. Trochanter IV notch moderate.

Femora light yellow. Rest of legs I and II yellow-white; rest of leg III light yellow; rest of leg IV orange with both ends of tibia and the tarsus lighter. Legs fairly heavily hirsute. Tibia I ventral spination: 2-2, moderately strong.

External epigynum with flared, heavily sclerotized openings (Fig. 33). Internal structure with globose spermathecae having thin posterior necks (Fig. 32).

Distribution. Southwestern U. S. and Mexico (Map 3).

Records. New Mexico. Bernalillo Co.

MEXICO. Nayarit.

Castianeira plorans (O. P.-Cambridge)

Figures 24-27, 79. Map 3.

Pedo plorans O.P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:274-275, pl. 33, figs. 10, 11, ♂, ♀. Male holotype from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined.

Castianeira plorans: F. P.-Cambridge, 1899, Biol. Centrali-Americana Arachnida 2:81.

MALE

Measurements. Based on one male holotype: carapace length 2.90 mm; carapace width 1.95 mm; carapace index 67; sternum length 1.25 mm; sternum width 1.05 mm; sternum index 80.

Femur IV length 2.20 mm; femur IV width 0.70 mm; leg thickness index 30; leg length index 77.

Abdomen length 2.95 mm; abdomen width 1.50 mm; abdomen index 51.

Embolus length 0.15 mm; bulb length 1.19 mm; male genital index 12.

Description. Carapace deep red-brown with some white hairs. Head narrow (cephalic width index 52) and smoothly truncated anteriorly. Eyes moderately small,

equal, and bordered in black. Thoracic groove moderately strong.

Abdomen a long oval with an almost full red-brown dorsal sclerite with white hairs in no discernible pattern, but more at anterior end. Epigastric and rectangular ventral sclerites red-brown with some dark hairs. A very small inframamillary sclerite. First pair of abdominal setae hair-like, second pair thin.

Sternum reddish orange-brown with very sparse setae and some low white hairs.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one much smaller than the retromargin teeth; with a very small denticle just medial and distal to the larger promargin tooth (Fig. 79).

Coxae all orange-brown. Trochanter IV notch moderately deep.

Femora all deep red-brown; rest of legs I and II deep yellow; rest of legs III and IV red-brown, with both ends of tibia IV lighter. Legs fairly heavily hirsute. Tibia I ventral spination: 2-2, very small.

Pedipalp with moderately small, blunt tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with a stout embolus with a spiral twist (Figs. 26, 27).

FEMALE

Measurements. Based on one female (paratype): carapace length 3.20 mm; carapace width 2.05 mm; carapace index 63; sternum length 1.35 mm; sternum width 1.20 mm; sternum index 88.

Femur IV length 2.40 mm; femur IV width 0.75 mm; leg thickness index 31; leg length index 75.

Abdomen length 4.40 mm; abdomen width 3.10 mm; abdomen index 71; dorsal sclerite length 0.40 mm; dorsal sclerite width 0.80 mm; dorsal sclerite index 192.

Description. Carapace deep red-brown with some white hairs. Head narrow (cephalic width index 60) and smoothly

truncated anteriorly. Eyes moderately small, equal, and bordered in black. Thoracic groove moderately strong.

Abdomen a wide oval with a very small, anterior, red-brown dorsal sclerite. A series of faint horizontal white hair bands on brownish abdomen. Epigastric sclerite red-brown. A very small inframamillary red-brown sclerite. Ventrums with two lines of light beaded stripes from both ends of epigastric furrow towards the spinnerets. First pair of abdominal setae very thin, second pair thin.

Sternum red-brown with sparse, thin setae.

Chelicerae red-brown with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one much smaller than the retromargin teeth; with a very small denticle just medial and distal to the larger promargin tooth.

Coxae orange-brown. Trochanter IV notch moderately deep.

Femora deep red-brown; rest of legs I and II yellow-orange; rest of III red-brown; rest of IV deep red-brown. Legs fairly heavily hirsute with some white hairs. Tibia I ventral spination: 2-2, moderately small.

External epigynum with flared semi-circular heavily sclerotized openings (Fig. 24). Internal structure with globose spermathecae having moderately thick posterior necks (Fig. 25).

Diagnosis. *Castianeira plorans* differs from most of the other *longipalpus* group species in its series of abdominal stripes; it differs from *C. lachrymosa* in its thicker, straighter spermathecal necks, and from *C. variata* in its short, stocky embolus.

Remarks. This species is one of many of the *longipalpus* group found in Mexico and may be representative of the whole Mexican fauna. O. P.-Cambridge (1899) notes that the males of *C. plorans* alone occur among the numerous females of *C. venusta*, *C. plorans*, and *C. lachrymosa* and that all these species may be varieties of one,

Castianeira venusta. The genital differences seem to preclude such a vast lumping of species, but further collections and studies are needed.

Natural history. Nothing is known of the habits or habitat of this species.

Distribution. Known only from the type locality in Guerrero, Mexico (Map 3).

Records. MEXICO. Guerrero.

Castianeira variata Gertsch

Figures 19–23, 60, 61, 78. Map 2.

Castianeira variata Gertsch, 1942, Amer. Mus. Novit. No. 1195:6, fig. 21, ♂, ♀. Male holotype from Cold Spring Harbor, Long Island, New York; in the American Museum of Natural History, examined.

MALE

Measurements. Based on holotype and 9 males, holotype listed first, range of all follows: carapace length 3.10 mm, 2.90–3.50 mm; carapace width 2.00 mm, 1.95–2.20 mm; carapace index 65, 63–67; sternum length 1.40 mm, 1.30–1.60 mm; sternum width 1.05 mm, 1.00–1.10 mm; sternum index 77, 68–78.

Femur IV length 2.40 mm, 2.15–2.60 mm; femur IV width 0.65 mm, 0.60–0.70 mm; leg thickness index 27, 27–28; leg length index 77, 72–79.

Abdomen length 3.30 mm, 3.10–3.75 mm; abdomen width 1.65 mm, 1.50–1.70 mm; abdomen index 50, 44–54.

Embolus length 0.34 mm, 0.31–0.36 mm; bulb length 1.28 mm, 1.20–1.32 mm; male genital index 27, 25–27.

Description. Carapace dark red-brown with white hairs. Eyes about equal and small. Carapace narrower in head region (cephalic width index 50–57) and smoothly truncated anteriorly. Thoracic groove fairly strong.

Abdomen a long oval with a full, maroonish red-brown dorsal sclerite and about eight horizontal bands of white hairs (many rubbed off) (Figs. 60, 78). Epigastric sclerite red-brown. Red-brown ventral sclerite rectangular from epigastric furrow to a small red-brown inframammillary

sclerite. Anterior pair of abdominal setae hairlike, posterior pair very thin.

Sternum red-brown with moderately thin, moderately long setae and short fine setae. Pedicel very short.

Chelicerae dark red-brown with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a small denticle just distal and median to the distal promargin tooth.

Coxa I orange-brown, coxae II, III, and IV yellow-brown. Trochanter IV notch moderately deep.

Femora all red-brown (light yellow at distal ends); rest of legs I and II yellow-white; rest of leg III yellow and rest of leg IV red-brown, with both ends of tibia yellow and a yellow tarsus. Legs moderately hirsute with some white hairs on femora. Tibia I ventral spination: 2–2, moderately small, proximal retrolateral spine smaller, sometimes absent.

Pedipalp with a small, blunt tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a long, straight, moderately heavy embolus widening slightly at the end with a terminal twist (Figs. 22, 23).

FEMALE

Measurements. Based on 10 females: carapace length 3.10–4.55 mm; carapace width 2.00–2.85 mm; carapace index 63–67; sternum length 1.40–2.20 mm; sternum width 1.10–1.50 mm; sternum index 67–84.

Femur IV length 2.35–3.45 mm; femur IV width 0.65–1.00 mm; leg thickness index 27–29; leg length index 72–79.

Abdomen length 4.00–6.40 mm; abdomen width 2.40–3.80 mm; abdomen index 54–67; dorsal sclerite width 0.90–1.30 mm.

Description. Carapace dark red-brown with white hairs, longer on head region. Eyes about equal and small. Carapace narrower in head region (cephalic width index 55–63) and smoothly truncated anteriorly. Thoracic groove fairly strong.

Abdomen oval with a small, dark red dorsal sclerite and black and white hair bands (most rubbed off) in nine horizontal white hair bands, with the last a wider posterior band (Fig. 61). Ventral area with two longitudinal beaded stripes from sides of epigastric furrow to a small red-brown inframamillary sclerite. Epigastric sclerite red-brown. Anterior pair of abdominal setae hairlike, posterior pair very thin.

Sternum red-brown with sparse, thin setae. Pedicel negligible.

Chelicerae dark red-brown with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a small denticle just distal and median to the distal promargin tooth.

Coxa I brown, coxa II moderate yellowish brown, coxae III and IV light yellow-brown. Trochanter IV notch moderately deep.

Femora all dark red-brown (light yellow at distal ends); rest of legs I and II light yellow; rest of III light yellow-brown; rest of leg IV red-brown with yellow annuli at both ends of tibia (reinforced with white hair) and light red-brown at center of the metatarsus. Legs moderately hirsute. Tibia I ventral spination: 2-2, moderately small, proximal retrolateral spine smaller.

External epigynum with a pair of low, fairly wide openings (Fig. 20). Internal structure with very wide bursae copulatrices to rounded spermathecae narrowing posteriorly into necks (Figs. 19, 21).

Diagnosis. The long embolus of the male and the wide epigynal openings and very wide bursae copulatrices of the female distinguish *Castianeira variata* from all other *longipalpus* group species.

Remarks. *C. variata* closely resembles *C. longipalpus* in non-genital characters. The extreme differences in genitalia may be the result of competitive pressures arising from their close relationship and sympatric distribution. This "character displacement" may have resulted, also, in the

temporal separation of the two species (see *Natural history*, below).

There is a great deal of variation in the extent of the abdominal white hair bands in the males, as illustrated in Figures 60 and 78.

Natural history. *Castianeira variata* is found in drier types of woodland and open areas (Fitch, 1963). It runs rapidly and jerkily and in momentary pauses; it has "the peculiar habit of pumping the abdomen up and down with a rhythmic, swaying motion" (Fitch, 1963), which is also observed in *Castianeira alba*.

Mature forms have only been found in early summer in New England and are therefore temporally separated from *Castianeira longipalpus*, a closely related species, which matures in late summer and early fall.

Distribution. New England to Kansas and Louisiana (Map 2).

Castianeira flebilis O. P.-Cambridge

Figures 38, 39, 74. Map 3.

Castianeira flebilis O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:286, pl. 32, fig. 8, ♀, from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined.

FEMALE

Measurements. Based on one female holotype: carapace length 3.55 mm; carapace width 2.30 mm; carapace index 65; sternum length 1.60 mm; sternum width 1.30 mm; sternum index 84.

Femur IV length 2.75 mm; femur IV width 0.85 mm; leg thickness index 31; leg length index 77.

Abdomen length 3.55 mm; abdomen width 2.10 mm; abdomen index 59; dorsal sclerite width 1.10 mm.

Description. Carapace orange-brown, covered with short, black hairs with some white hairs posterior to the thoracic groove. Carapace moderately narrow in head region (cephalic width index 63) and smoothly but distinctly truncated anteriorly. Eyes



bordered in black. Thoracic groove moderate.

Abdomen oval, with small, light red-brown dorsal sclerite and dorsal black and white hair pattern—median white hair band from anterior end, one-quarter way posteriorly; then from midpoint posteriorly, three horizontal chevrons and a posterior white hair band (Fig. 74). White hair spot on each side of abdomen. Ventrums light yellow with no markings. Abdominal setae very thin, anterior pair thinner.

Sternum red-brown with long setae, especially at edges. Pedicel very short.

Chelicerae light brown, with two moderate retromargin teeth and two promargin teeth; the distal larger and the proximal much smaller than the retromargin teeth, with a small denticle just distal to the larger promargin tooth.

Coxae all light brown. Trochanter IV notch moderate.

Femora medium brown; rest of legs I and II light yellow; rest of leg III dark yellow; rest of leg IV yellow-brown, with ends of tibia and the tarsus slightly lighter. Legs moderately hirsute with some black and white hairs on the femora.

External epigynum with heavily sclerotized, flared openings (Fig. 39). Internal structure of basic inverted pear-shape with thick necks (Fig. 38).

Diagnosis. *Castianeira flebilis* differs from other members of the *longipalpus* group species in its abdominal pattern and extremely thick spermathecal necks.

Remarks. Part of the Mexican fauna, *C. flebilis* is very different from other species collected in Amula.

Natural history. Nothing is known of the habits and habitat of this species.

Distribution. Only known from the type locality in Guerrero, Mexico (Map 3).

Records. MEXICO. Guerrero.

Castianeira crocata (Hentz)

Frontispiece. Figures 44, 45, 56. Map 2.

Herpyllus crocatus Hentz, 1847, Boston J. Nat. Hist. Soc. 5:457, pl. 24, fig. 8, ♂, from Alabama; lost.

Liocranum crocatus: Marx, 1883, Araneina, in Howard, L. O., A List of the Invertebrate Fauna of South Carolina, Charleston, p. 23.

Thargalia crocata: Marx, 1889, Proc. U. S. Nat. Mus. 12:513.

Castianeira crocata: Banks, 1910, Bull. U. S. Nat. Mus. 72:11.

FEMALE

Measurements. Based on 11 females: carapace length 3.30–4.55 mm; carapace width 2.15–3.15 mm; carapace index 61–70; sternum length 1.50–1.95 mm; sternum width 1.20–1.60 mm; sternum index 79–85.

Femur IV length 2.50–3.40 mm; femur IV width 0.75–1.05 mm; leg thickness index 29–31; leg length index 73–78.

Abdomen length 3.30–5.90 mm; abdomen width 1.95–4.50 mm; abdomen index 52–82; dorsal sclerite width 0.85–1.30 mm.

Description. Carapace dark maroon with short whitish hair. Carapace narrow in head region (cephalic width index 52–60) and smoothly truncated anteriorly. Eyes fairly small and equal. Thoracic groove moderately strong.

Abdomen oval with a small, anterior, maroon dorsal sclerite and a pattern of red-orange and black plumose hairs—a wide median stripe of bright red-orange from just posterior to the sclerite to just anterior of the spinnerets (Fig. 56), rest of abdomen covered with black hairs. Epigastric sclerite red-brown. Ventrums with two faint, light, longitudinal stripes from epigastric furrow to near the spinnerets. Small red-brown inframmillary sclerite. First pair of abdominal setae hairlike, second pair thin.

Sternum red-brown with long, thin setae. Short pedicel.

Chelicerae red-brown with two moderate

retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a very small denticle just medial and distal to the larger retromargin tooth.

Coxae all orange-brown. Trochanter IV notch moderate.

Femora all dark reddish brown. Rest of legs I and II yellow-brown; the patella and proximal ends of the tibia darker; rest of III and IV red-brown with dark yellow tarsi. Tibia I ventral spination: 2–2, moderate.

External genitalia with a pair of oval openings (Fig. 44). Internal structure with extremely globose spermathecae having narrow, posterior necks (Fig. 45).

Diagnosis. *Castianeira crocata* differs from other *longipalpus* group species in its long, abdominal, red-orange stripe and globose anterior spermathecae with very distinct thin necks. *C. floridana* has a smaller abdominal spot and less of a distinction between globe and neck in the spermathecae. *C. venusta* has a longer stripe and an outward turn of the spermathecal necks. *C. crocata* differs from the *descripta* group in its female genitalia (Figs. 44, 45).

Remarks. *Castianeira crocata* has often been synonymized with *C. descripta*, whose striking abdominal pattern is superficially similar. Banks (1916) clearly saw the distinction when he recognized “the true *crocata*” as a southern form and the northern “*crocata*” as *C. descripta*. The female genital structure distinctly separates the two species.

No males are definitely associated with this species, but the male of *C. floridana* is probably very close to the hypothetical *C. crocata* male.

Natural history. While this species is found predominantly in southern U. S., it broadly overlaps *C. descripta*, with which it is often confused, and it is possible that references to “*C. descripta*” in Oklahoma and possibly Nebraska refer to this species (see *Natural history*, under *Castianeira*

descripta). Hentz (1847) notes, "This species inhabits houses, hiding in cracks, under boards, etc." This is possibly a mutillid wasp mimic.

Distribution. Southern New Jersey to Missouri and south to Texas (Map 2).

***Castianeira floridana* (Banks)**

Figures 40–43, 58, 59. Map 3.

Thargalia floridana Banks, 1904, Proc. Acad. Nat. Sci. Philadelphia 56:124, pl. 7, fig. 11, imm. ♀. Penultimate female holotype from Punta Gorda, Florida; in the Museum of Comparative Zoology, examined.

Castianeira floridana: Banks, 1910, Bull. U. S. Nat. Mus. 72:11.

Castianeira cubana Bryant, 1940, Bull. Mus. Comp. Zool. 86(7):446, pl. 17, figs. 228, 232, ♂, ♀. Male holotype from Soledad, Cuba; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

MALE

Measurements. Based on 5 males: carapace length 2.60–3.15 mm; carapace width 1.80–2.15 mm; carapace index 68–70; sternum length 1.20–1.45 mm; sternum width 1.05–1.10 mm; sternum index 77–87.

Femur IV length 1.95–2.30 mm; femur IV width 0.60–0.75 mm; leg thickness index 30–33; leg length index 73–77.

Abdomen length 2.65–3.65 mm; abdomen width 1.50–1.80 mm; abdomen index 49–60.

Embolus length 0.15–0.16 mm; bulb length 0.91–1.19 mm; male genital index 13–18.

Description. Carapace deep red-brown, almost maroon, covered with short white hairs, longer hairs on cephalic region. Head narrow (cephalic width index 48–52) and smoothly truncated anteriorly. Eyes moderately small, equal, and bordered in black. Thoracic groove moderately strong.

Abdomen elongated oval with a full, dark red-brown dorsal sclerite, lighter spot with bright orange hair at posterior end, and covered with black and white hairs—white hairs in two wide horizontal bands, followed by a thinner horizontal band at the midline, followed by two more, thinner,

bands (Fig. 59). Epigastric and almost full ventral sclerites dark red-brown. Small brown inframammillary sclerite. First pair of abdominal setae thin and long, second pair moderate.

Sternum shield-shaped with sparse, fairly short, thin setae. Pedicel short.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one much smaller than the retromargin teeth; with a very small denticle just medial and distal to large promargin tooth.

Coxae all deep orange-brown. Trochanter IV notch moderately small.

Femora all red-brown. Rest of legs I and II deep yellow-brown; rest of legs III and IV red-brown, with tarsi of all legs yellow-brown. Legs moderately heavily hirsute. Tibia I ventral spination: 2–2, moderately small.

Pedipalp with a blunt, short tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a straight, fairly stout, heavily sclerotized embolus having a distinct spiral twist at the tip (Figs. 42, 43).

FEMALE

Measurements. Based on 6 females: carapace length 3.15–3.60 mm; carapace width 2.10–2.50 mm; carapace index 63–70; sternum length 1.50–1.70 mm; sternum width 1.10–1.30 mm; sternum index 75–81.

Femur IV length 2.30–2.80 mm; femur IV width 0.70–0.85 mm; leg thickness index 29–33; leg length index 70–78.

Abdomen length 3.50–4.65 mm; abdomen width 2.05–3.20 mm; abdomen index 57–69; dorsal sclerite length 0.60–0.85 mm; dorsal sclerite width 0.85–1.20 mm; dorsal sclerite index 130–180.

Description. Carapace deep red-brown with sparse, short, white hairs. Head narrow (cephalic width index 55–62) and smoothly truncated anteriorly. Eyes quite small, equal, and bordered in black. Thoracic groove moderately strong.

Abdomen a wide oval with a small, dark red-brown anterior dorsal sclerite. Covered with brownish hairs with a large bright median spot (both orange hairs and light pigmentation) just posterior to the midline (Fig. 58). Epigastric sclerite orange-brown. Four light pigmented, thin, beaded stripes running from epigastric furrow to area just anterior to the spinnerets, the two lateral stripes clearer than the median pair. First pair of abdominal setae very thin, second pair slightly thicker.

Sternum shield-shaped and red-brown with sparse, thin setae. Pedicel short.

Chelicerae red-brown with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one much smaller than the retromargin teeth; with a very small denticle just medial and distal to large promargin tooth.

Coxae all deep yellowish brown. Trochanter IV notch moderate.

Femora all red-brown (hind pair darker). Rest of legs I and II light yellow-orange; rest of leg III yellow-brown and of leg IV red-brown, with both tarsi yellow-orange. Legs moderately hirsute. Tibia I ventral spination: 2-2, moderately small.

External epigynum with heavily sclerotized semicircular openings (Fig. 41). Internal structure heavily sclerotized, with a rounded bulb drawn posteriorly into a long thin neck (Fig. 40).

Diagnosis. *C. floridana* differs from other *longipalpus* group species having red-orange hair on the abdomen by the restriction of this hair to a median spot in the female and a distinct black, white, and red hair pattern in the male. The female epigynum is also distinct from that of *C. crocata*.

Remarks. This species is allopatric with *C. crocata*, to which it is closely related. The distinct genitalic and pattern differences, however, probably justify its specific rank. The Cuban form has a slightly longer embolus (male genital index 18) than the Floridian form (male genital index 13-14) but agrees in all the other characters.

Castianeira cubana Bryant is not only the synonym of *C. floridana* but also the junior homonym of *C. cubana* (Banks).

Natural history. Nothing is known of the habits or habitat of this species. It is possible that this is a mutillid mimic.

Distribution. Southern Florida and Cuba (Map 3).

Castianeira venusta (Banks)

Figures 36, 37, 57. Map 3.

Pedo ornatus O. P.-Cambridge, 1896, Biol. Centrali-Americana Arachnida 1:220, pl. 26, fig. 14, ♀. Female syntypes from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined. Female lectotype chosen. A secondary junior homonym of *Herpyllus ornatus* Hentz.

Pedo plumosus O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:242-243, pl. 31, fig. 12, ♀, from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined. (Not *Corinna plumosa* Thorell, 1881.) NEW SYNONYMY.

Thargalia venusta Banks, 1898, Proc. California Acad. Sci. (3)1(7):227, pl. 13, fig. 35, ♀, from San Miquel, Sonora, Mexico; destroyed.

Castianeira ornata: F. P.-Cambridge, 1899, Biol. Centrali-Americana Arachnida 2:81.

Castianeira plumosa: F. P.-Cambridge, 1899, Biol. Centrali-Americana Arachnida 2:81.

Castaneira venusta: Petrunkevitch, 1911, Bull. Amer. Mus. Nat. Hist. 29:456.

Castianeira pedo Roewer, 1951, Abhandl. Natur. Verhändl. Bremen 32(2):446 (*nomen novum* for *Pedo plumosus* O. P.-Cambridge). NEW SYNONYMY.

FEMALE

Measurements. Based on lectotype and 2 females, lectotype listed first, range of all follows: carapace length 3.30 mm, 3.30-3.40 mm; carapace width 2.20 mm, 2.20-2.30 mm; carapace index 67, 65-69; sternum length 1.45 mm, 1.45-1.60 mm; sternum width 1.20 mm, 1.20-1.30 mm; sternum index 85, 81-85.

Femur IV length 2.60 mm, 2.60-2.65 mm; femur IV width 0.75 mm, 0.75-0.80 mm; leg thickness index 29, 29-31; leg length index 78, 75-79.

Abdomen length 4.60 mm, 4.30-4.60 mm; abdomen width 2.90 mm, 2.80-2.90 mm;



abdomen index 63, 63–66; dorsal sclerite length (lectotype not included) 0.60–0.65 mm; dorsal sclerite width 0.95 mm, 0.95–1.00 mm; dorsal sclerite index (lectotype not included) 150–172.

Description. Carapace deep red-brown, covered with short black hairs. Carapace moderately narrow in head region (cephalic width index 60) and smoothly truncated anteriorly. Eyes bordered in black and almost equal, the anterior lateral eyes slightly larger than the anterior median eyes. Thoracic groove moderate.

Abdomen oval, with a small red-brown dorsal sclerite and a dorsal hair pattern—two short horizontal bands of white hair at anterior end (over sclerite), followed by a wide, longitudinal band of orange hairs on light pigment running full length to just before posterior, where it ends in a narrow, horizontal white hair band (Fig. 57). Two large white hair spots on each side of abdomen. Ventral abdomen light brown, with two longitudinal beaded lines of light pig-

ment running from sides of epigastric furrow almost to spinnerets. Abdominal setae very thin.

Sternum deep red-brown with long setae, especially at edges. Pedicel negligible.

Chelicerae brown with two moderate retromargin teeth and two promargin teeth; the distal larger and the proximal smaller than the retromargin teeth (trace of vestigial denticle).

Coxae all light brown. Trochanter IV notch moderately strong.

Femora dark brown. Rest of legs I and II yellow; rest of legs III and IV brown, with lightened areas reinforced by light hair at distal end of patella III, proximal end of tibia III, both ends of tibia IV and tarsus IV. Legs moderately hirsute.

External epigynum with heavily sclerotized, flared openings (Fig. 37). Internal structure with globose spermathecae having narrow posterior necks turned outwards (Fig. 36).

Remarks (see *Remarks* under *C. plorans*).

White spots on side of abdomen sometimes absent.

Natural history. Nothing is known of the habits or habitat of this species.

Distribution. Mexico, and reported by O.P.-Cambridge (1899) from Guatemala (Map 3).

Records. MEXICO. Guerrero. Sonora.

THE *AMOENA* GROUP

Characteristics. Moderately large (male carapace length 2.60–3.55 mm; female carapace length 3.15–4.30 mm;), with carapace index 63–70. Abdomen completely covered with plumose hairs with black horizontal stripes and pairs of spots on a bright orange background. Spermathecae with globose anterior ends, moderately thin posterior necks, and wide bursae copulatrices. Male genital index 21–26, with slightly curved emboli. Eyes moderately small and equal.

Discussion. This group is closely related to the *longipalpus* group, but its distinctive genitalia and patterns easily distinguish it.

Castianeira amoena (C. L. Koch)

Figures 70–73, 84, 85. Map 4.

Corinna amoena C. L. Koch, 1842, *Die Arachniden* 9:21–22, fig. 705, ♀, from “Carolina”; lost.

Herpyllus ornatus Hentz, 1847, *Boston J. Nat. Hist. Soc.* 5:456, pl. 24, fig. 6, ♀, from North Carolina; lost.

Herpyllus marmoratus Hentz, 1847, *Boston J. Nat. Hist. Soc.* 5:458, pl. 24, fig. 10, ♂, from Alabama; lost.

Castianeira amoena: Banks, 1910, *Bull. U.S. Nat. Mus.* 72:11 (= *ornatus*, = *marmoratus*). Bishop and Crosby, 1926, *J. Elisha Mitchell Sci. Soc.* 41(3–4):185, pl. 23, fig. 34, ♂.

MALE

Measurements. Based on 10 males: Carapace length 2.60–2.95 mm; carapace width 1.75–2.05 mm; carapace index 66–70; sternum length 1.10–1.30 mm; sternum width 0.95–1.05 mm; sternum index 80–83.

Femur IV length 1.80–2.15 mm; femur IV width 0.60–0.75 mm; leg thickness index 32–35; leg length index 68–72.

Abdomen length 2.70–3.50 mm; abdomen width 1.45–1.90 mm; abdomen index 50–57.

Embolus length 0.23–0.26 mm; bulb length 1.01–1.19 mm; male genital index 21–24.

Description. Carapace dark orange with light orange hairs; narrow in head region (cephalic width index 49–53) and smoothly truncated anteriorly. Ocular region much darker. Eyes moderately small and equal. Thoracic groove moderate.

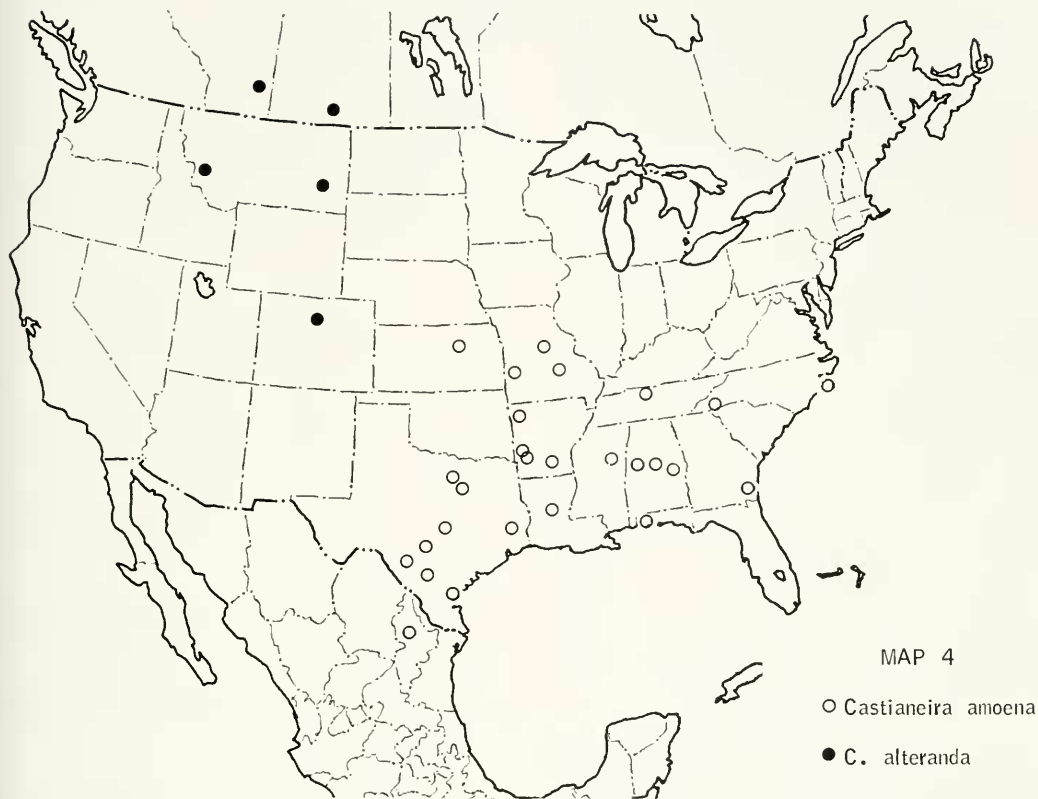
Abdomen oval, with an almost complete maroon dorsal scutum with about seven horizontal black pigment bands on it, the posterior couple missing the median section (Fig. 85). Dark orange hairs arise from darker areas and light yellow hairs arise from lighter areas. Orange hairs predominate on sides and posterior. Epigastric sclerite red-brown. Rectangular, dark red-brown ventral sclerite from epigastric furrow posteriorly about four-fifths distance to posterior spiracular furrow and covered with plumose white hairs. Very small, red-brown inframamillary sclerite. Both pairs of abdominal setae very thin.

Sternum orange-brown with sparse, thin setae. Short pedicel.

Chelicerae dark red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one large and the proximal one similar to retromargin teeth. A small denticle distal to larger promargin tooth.

Coxa I brown; II, III, and IV light brown. Trochanter IV with a moderate notch.

Femora I and II dark brown, rest of legs I and II light yellow. Femora III and IV orange-brown, with broad, dark brown hair and pigment rings at distal ends (with light tip). Patellae and tibiae of III and IV each with a light ring at each end (especially strong in tibia IV). Rest of III dark yellow. Metatarsus IV dark brown with faintly lighter central annulus, and tarsus IV yellow. Legs moderately hirsute. Tibia I ventral spination: 2–1, moderate.



Pedipalp with slight tibial apophysis. Tarsus with globose genital bulb drawn out into long neck with a fairly thin, slightly curved, sclerotized embolus (Figs. 72, 73).

FEMALE

Measurements. Based on 10 females: carapace length 3.15–3.55 mm; carapace width 2.10–2.35 mm; carapace index 65–68; sternum length 1.40–1.50 mm; sternum width 1.10–1.25 mm; sternum index 77–85.

Femur IV length 2.20–2.50 mm; femur IV width 0.70–0.80 mm; leg thickness index 32–33; leg length index 65–74.

Abdomen length 3.45–4.50 mm; abdomen width 1.85–2.95 mm; abdomen index 53–65; dorsal sclerite width 1.20–1.30 mm.

Description. Carapace bright orange with orange hairs; narrow in head region (cephalic width index 56–58) and smoothly

truncated anteriorly. Ocular region much darker. Eyes moderately small and equal. Thoracic groove fairly weak.

Abdomen oval, with a moderate, anterior, light orange dorsal sclerite; horizontal, alternating black and white, plumose hair bands complete and fairly wide anteriorly, becoming thinner and missing median sections posteriorly; orange plumose hairs in a posteriorly widening and darkening band, starting at sclerite and replacing areas of white hairs. Total of about eight black hair bands or pairs of black hair spots (Fig. 84). Epigastric sclerite yellow. Ventral abdomen white. Both pairs of abdominal setae very thin.

Sternum light yellow, with sparse, long, thin setae. Short pedicel.

Chelicerae yellow-brown, with two moderate retromargin teeth and two promargin

teeth, the distal one large and the proximal one similar to retromargin teeth. A small denticle distal to the larger promargin tooth.

Coxae all light yellow. Trochanter IV with a deep notch.

Femora I and II dark brown (covered with dark dense hairs), tips of femora and rest of legs I and II yellow-white. Femora III and IV yellow-orange, with broad, dark brown hair rings at distal ends (but with white tip). Patellae and tibiae of III and IV each with a broad white hair (and light pigment) ring at each end. Rest of III dark yellow. Metatarsus IV dark brown, with faintly lighter central annulus, and tarsus IV dark yellow. Legs moderately hirsute. Tibia I ventral spination: 2-2, moderate (proximal retrolateral spine smaller).

External genitalia with a pair of flat oval openings (Fig. 71). Internal structure with globose spermathecae narrowing gradually to posterior necks (Fig. 70).

Diagnosis. *Castianeira amoena* differs from *C. alteranda* in its stocky legs (leg thickness index 32-35) as well as some differences in its abdominal pattern.

Remarks. (See *Remarks* under *Castianeira alteranda*.)

Natural history. *Castianeira amoena*, mainly a southern species, is found in the non-forest maritime communities of North Carolina (Barnes, 1953a and 1953b) and under rock and stones and on stone outcrops in eastern Nebraska (Worley and Pickwell, 1931). Hentz (1847) reports the species "wandering on paths, and very active, in woods or unfrequented places."

Distribution. Southeastern U.S. (Map 4).

Castianeira alteranda Gertsch

Figures 66-69, 83. Map 4.

Castianeira alteranda Gertsch, 1942, Amer. Mus. Novit. No. 1195:6, figs. 19-20, ♂, ♀. Male holotype from Hamilton, Ravalli Co., Montana; in the American Museum of Natural History, examined.

MALE

Measurements. Based on holotype and one male, holotype listed first, range of both follows: carapace length 3.55 mm, 3.30-3.55 mm; carapace width 2.35 mm, 2.15-2.35 mm; carapace index 66, 66; sternum length 1.60 mm, 1.50-1.60 mm; sternum width 1.20 mm, 1.15-1.20 mm; sternum index 78, 78.

Femur IV length 2.80 mm, 2.40-2.80 mm; femur IV width 0.70 mm, 0.65-0.70 mm; leg thickness index 25, 25-27; leg length index 78, 74-78.

Abdomen length 3.85 mm, 3.30-3.85 mm; abdomen width 2.15 mm, 1.70-2.15 mm; abdomen index 56, 52-56.

Embolus length 0.34 mm, 0.31-0.34 mm; bulb length 1.34 mm, 1.24-1.34 mm; male genital index 26, 25-26.

Description. Carapace orange, with very short orange hairs. Eyes small, about equal, and bordered in black. Carapace narrower in head region (cephalic width index 52-55) and smoothly truncated anteriorly. Thoracic groove moderately strong.

Abdomen oval with a seven-eighths full red-brown dorsal sclerite covered with orange-white and black hairs in obscure bands (most rubbed off). Epigastric sclerite red-brown. Ventral, elongate, orange-brown, rectangular sclerite running from epigastric furrow almost to spiracular furrow. A small orange inframammillary sclerite. Anterior abdominal setae thin, posterior pair stouter.

Sternum orange, covered with sparse, small, thin orange setae. Pedicel very small.

Chelicerae orange, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one slightly smaller. A small denticle distal to larger promargin tooth.

Coxae dark yellow-orange. Trochanter IV notch moderate.

Femora red-brown. Rest of legs I and II yellow-brown; rest of leg III deep red-brown (patella lighter); rest of leg IV dark red-brown (patella and both ends of tibia

lighter). Tibia I ventral spination: 2-2, small, proximal retrolateral spine smaller than the rest.

Pedipalp with a moderate pointed tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a long, slightly curved, and fairly thick embolus (Figs. 68, 69).

FEMALE

Measurements. Based on 2 females: carapace length 3.65-4.30 mm; carapace width 2.30-2.80 mm; carapace index 63-65; sternum length 1.65-1.85 mm; sternum width 1.30-1.45 mm; sternum index 79-80.

Femur IV length 2.95-3.30 mm; femur IV width 0.70-0.85 mm; leg thickness index 24-26; leg length index 77-81.

Abdomen length 4.20-5.65 mm; abdomen width 2.10-3.65 mm; abdomen index 50-64; dorsal sclerite width 1.05-1.10 mm.

Description. Carapace dark yellow with low orange hairs. Eyes fairly small, equal, and bordered in black. Carapace narrows in head region (cephalic width index 61-62) and is smoothly truncated anteriorly. Thoracic groove moderately strong.

Abdomen oval with a small, orange, anterior dorsal sclerite and a black and orange dorsal hair pattern (the orange becoming white on sides of abdomen) of three wide horizontal orange bands joined broadly along the median, followed by two thin horizontal bands and a wide band just anterior to the spinnerets (Fig. 83). Yellow epigastric sclerite. Ventral abdomen with two parallel white stripes from ends of epigastric furrow posterior to the spinnerets. Anterior abdominal setae thin, posterior pair stouter.

Sternum yellow-orange with long, thin setae. Pedicel very small.

Chelicerae yellow-orange, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one slightly smaller. A small denticle distal to larger promargin tooth.

Coxae dark yellow (IV slightly darker).

Trochanter IV notch moderately strong.

Femora all yellow-orange. Rest of legs I and II very light yellow; rest of leg III yellow-orange, with metatarsus and tarsus yellow-brown; rest of IV yellow-orange, with tarsus brown and ends of tibia very light yellow with white hairs. Legs moderately hirsute. Tibia I ventral spination: 2-1, small.

External epigynum with two oval openings (Fig. 66). Internal structure with somewhat globose spermathecae with moderately wide necks posteriorly and wide bursae copulatrices (Fig. 67).

Diagnosis. *Castianeira alteranda* differs from *C. amoena* in its moderately thin legs (leg thickness index 24-27), as well as in having some differences in its abdominal pattern.

Remarks. *C. alteranda* is similar to *C. amoena* but slightly larger, with longer, thinner legs and emboli. The two groups are entirely allopatric and may be the extremes of a geographic cline, but until intermediates are found, they should be considered separate species.

Natural history. Nothing is known of the habits of this species.

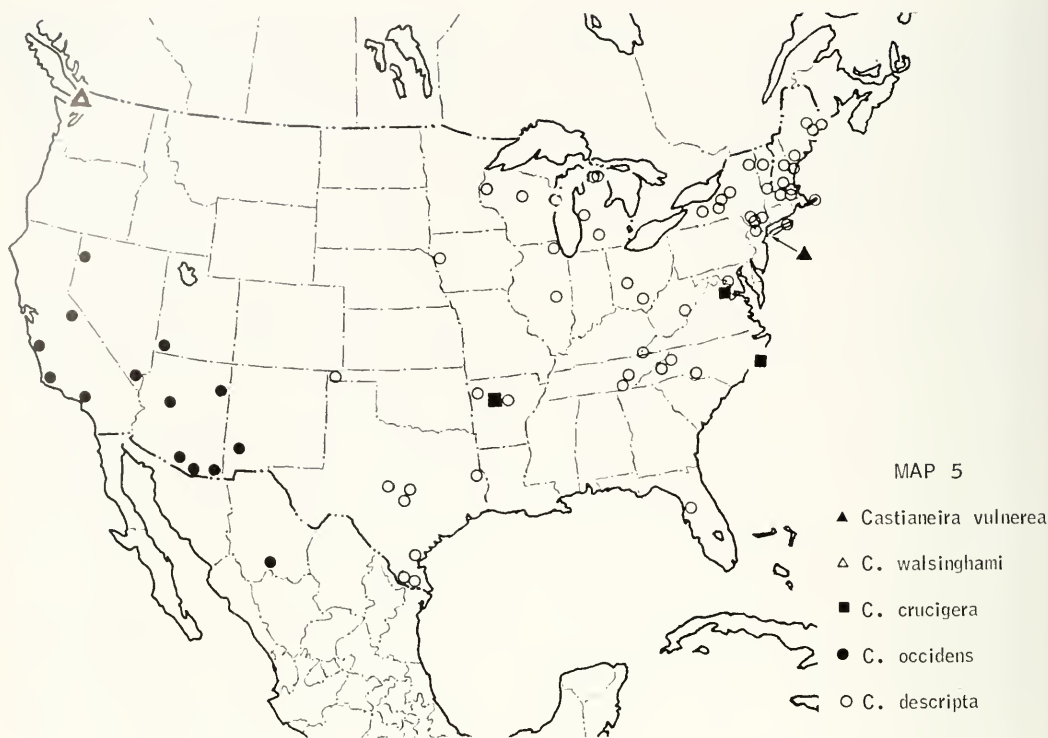
Distribution. Montana, Colorado, Alberta, and Saskatchewan (Map 4).

Records. CANADA. *Alberta.* *Saskatchewan.*

Colorado. Boulder Co. *Montana.* Custer Co., Ravalli Co.

THE DESCRIPTA GROUP

Characteristics. Moderately large (male carapace length 2.10-3.70 mm; female carapace length 2.60-4.05 mm), with a carapace index 63-72. Abdomen covered with plumose hairs with a red-orange posterior spot, often extending considerably anteriorly and laterally, or a white hair pattern. Spermathecae with globose anterior ends and thick, slightly twisted posterior necks. Epigynal openings small and round. Male genital index 15-18, with fairly thin emboli. Moderately stocky, with the leg thickness



index of the females 25–31. Eyes moderately small and equal.

Discussion. This group is closely related to the preceding two species groups, but the distinctive female genitalia clearly differentiates it. Two sub-groups can be distinguished: (1) *C. descripta*, *C. occidens*, and *C. walsinghami*, and (2) *C. crucigera* and *C. vulnerea*. The first group has an abdominal red-orange posterior spot, while the second group has a white hair pattern concentrated along the midline of the abdomen. The three species in the first group are allopatric, closely related, and may all be part of one polytypic species, but they are separated, conditionally, on the basis of their pattern differences and slight genital differences.

***Castianeira descripta* (Hentz)**

Figures 88–91, 121. Maps 5, 6.

? *Sphasus vittatus* Walckenaer, 1837, *Histoire Naturelle des Insectes Aptères* 1:378 (Abbot,

1792, *Spiders of Georgia* fig. 369, examined). *Nomen oblitum*.¹

Herpyllus descriptus Hentz, 1847, *Boston J. Nat. Hist. Soc.* 5:456, pl. 24, fig. 7, ♀, from North Carolina; lost.

Geotrechia crocata: Emerton, 1889, *Trans. Connecticut Acad. Sci.* 8(9):171, pl. 3, fig. 3, ♂, ♀. Emerton, 1902, *The Common Spiders of the United States*, Boston, p. 7, figs. 20–22, ♂, ♀.

Thargalia agilis Banks, 1892, *Proc. Acad. Nat. Sci. Philadelphia* 1892(1):15, fig. 52, ♀, from Six Mile Creek, near Ithaca, New York; in the Museum of Comparative Zoology, examined. **NEW SYNONYMY.**

Thargalia fallax Banks, 1892, *Proc. Acad. Nat. Sci. Philadelphia* 1892(1):16, pl. 1, fig. 54, ♂. Male syntypes from Ithaca, New York; in the Museum of Comparative Zoology, examined.

Thargalia crocata: Banks, 1892, *Proc. Acad. Nat. Sci. Philadelphia* 1892(1):17.

Castianeira descripta: Simon, 1897, *Histoire Naturelle des Araignées*, II, fasc. 1:158, figs. 161, 162, ♂. Comstock, 1912, *The Spider Book*, Ithaca, New York, p. 578, figs. 656, 657.

¹ This name has gone unused since Walckenaer's description (1837), except in a review of Walckenaer's work by Chamberlin and Ivie (1944).

Castianeira descripta: Chickering, 1939, Pap. Michigan Acad. Sci. 24(2):59, figs. 20–23, ♂, ♀. Kaston, 1948, Connecticut Geol. and Nat. Hist. Surv. Bull. 70:395, figs. 1402, 1409–1410, 1426, ♂, ♀.

MALE

Measurements. Based on 11 males: carapace length 2.90–3.70 mm; carapace width 1.95–2.40 mm; carapace index 65–68; sternum length 1.25–1.65 mm; sternum width 1.05–1.30 mm; sternum index 77–86.

Femur IV length 2.20–2.85 mm; femur IV width 0.60–0.75 mm; leg thickness index 26–28; leg length index 73–81.

Embolus length 0.15–0.19 mm; bulb length 0.93–1.10 mm; male genital index 15–17.

Description. Carapace red-brown, covered with short black and white hairs. Carapace narrow in head region (cephalic width index 53–58) and smoothly truncated anteriorly. Ocular region darker. Eyes small and equal. Thoracic groove strong.

Abdomen oval, with an almost full, dark red-brown dorsal sclerite covered with fine hair—red-orange hairs on redder posterior half and extending anteriorly onto red-brown ground. Some white hairs at anterior end. Epigastric and ventral sclerite red-brown. Ventral sclerite elongated rectangle, almost extending to a small orange-brown inframammillary sclerite. First pair of abdominal setae thin, second pair moderately thin.

Sternum dark red-brown, shield-shaped, with sparse, thin setae. Pedicel very short.

Chelicerae red-brown with two moderately large retromargin teeth and two promargin teeth, the distal one larger and the proximal smaller than the retromargin teeth. A small denticle medial and distal to the larger promargin tooth.

Coxae all orange-brown. Trochanter IV notch moderate.

Femora all dark red-brown. Rest of legs I and II yellow; of leg III orange-brown; of leg IV red-brown, with a yellow-brown

tarsus. Legs moderately hirsute. Tibia I ventral spination: 2–2, moderate.

Pedipalp with a short, blunt tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a straight, thin embolus, twisted at the tip (Fig. 90, 91).

FEMALE

Measurements. Based on 15 females: carapace length 3.30–3.95 mm; carapace width 2.10–2.60 mm; carapace index 63–67; sternum length 1.45–1.80 mm; sternum width 1.15–1.55 mm; sternum index 79–86.

Femur IV length 2.45–3.10 mm; femur IV width 0.70–0.90 mm; leg thickness index 25–31; leg length index 71–83.

Description. Carapace red-brown, covered with short black and white hairs. Carapace narrow in head region (cephalic width index 57–61) and smoothly truncated anteriorly. Ocular region darker. Eyes moderately small and equal. Thoracic groove moderately strong.

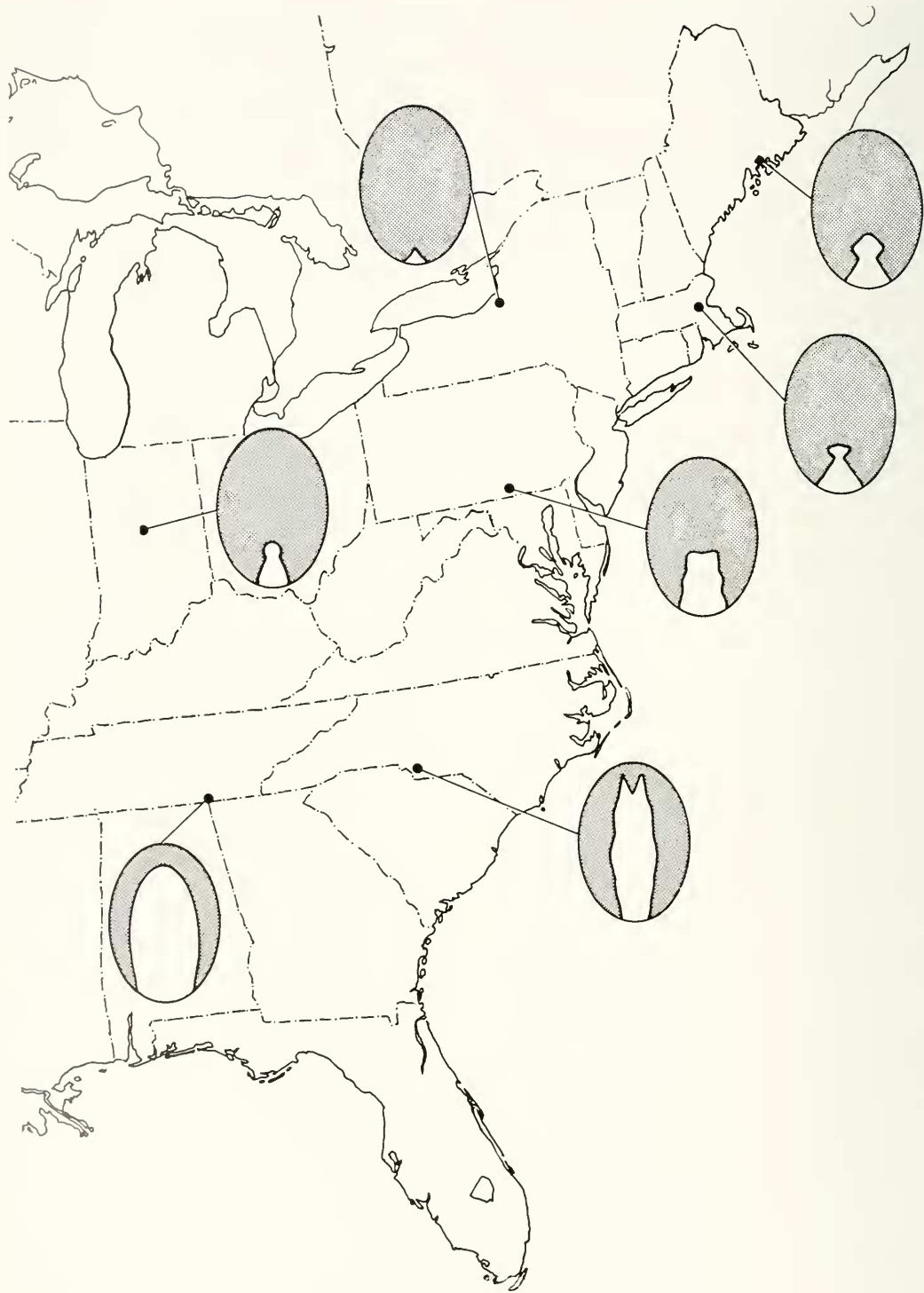
Abdomen oval, with a very small, rounded, anterior, red-brown dorsal sclerite and covered with dark brown or brown-black hairs, with a wide red spot at posterior end narrowing anteriorly, resulting in a bright red-orange posterior wedge (Fig. 121). Epigastric sclerite red-brown. Two light pigmented, thin, beaded stripes from lateral sides of epigastric furrow posteriorly towards spinnerets. First pair of abdominal setae very thin, second pair thin.

Sternum as in male.

Chelicerae dark red-brown with two moderately large retromargin teeth and two promargin teeth, the distal one large and the proximal smaller than the retromargin teeth. A small distinct denticle medial and slightly distal to the larger promargin tooth.

Coxae all red-brown. Trochanter IV notch moderate.

Femora all red-brown. Rest of legs I and II deep yellow; of legs III and IV with patella-tibia striped red-brown with two



lateral dorsal yellow stripes, metatarsi red-brown, tarsi yellow brown. Legs moderately hirsute. Tibia I ventral spination: 3-2, moderate (proximal prolateral spine much smaller than the rest).

External epigynum with two widely separated, small, circular openings (Fig. 89). Internal structure heavily sclerotized with saclike spermathecae narrowing only slightly posteriorly (Fig. 88).

Diagnosis. *Castianeira descripta* can be distinguished from other *descripta* group species by its posterior red spot (sometimes very small) and the absence of a white longitudinal stripe on the carapace.

Remarks. This wide-spread American species shows geographic variation in the size of its posterior red spot, which increases in size towards the south and west (see Map 6). This seems to be a smooth cline, and while there is a good deal of variation within each area, there is no evidence of any polymorphism.

This species is not closely related to *Castianeira crocata* (see *Remarks* under *C. crocata*).

Natural history. *Castianeira descripta* is found in forest litter, beneath logs and stones and among leaves on the ground in Michigan (Chickering, 1939), commonly on the ground in dry fields and pastures in Ohio (Barrows, 1918), on the ground and under stones in the prairie of Oklahoma (Banks, Newport and Bird, 1932), on dusty roads and under boards in Nebraska (Worley and Pickwell, 1931), and on straw washed up by the tide in Nantucket (Emerton, 1930). Generally *C. descripta* is found in more open ground than are *C. longipalpus* and *C. cingulata*. It feeds on small insects, and has no special prey (Bilasing, 1920).

Montgomery (1909) noted the similarity of the method of copulation of *C. descripta*

to that of *C. longipalpus* (see *Natural history* under the latter species).

The egg case is like that of *C. longipalpus*, a white disc. One egg case from Ithaca, New York (August 5), contained 22 eggs; Kaston (1948) reports one (August 30) with 14 eggs; and Fitch (1963) reports two, one with 26 eggs and one with 19.

Scheffer (1906) notes that ". . . from its general appearance and movements this spider might, at first sight, be easily mistaken for a velvet ant (mutillid)." Fitch (1963) describes the jerky, darting movements and the devious course of the foraging spider.

Distribution. Eastern U.S. (Map 5).

Castianeira occidentalis new species

Figures 96-99, 113-115. Map 5.

Holotype. Male from Lakeside, Navajo Co., Arizona, 8-VII-1940 (Gertsch and Hook); in the American Museum of Natural History. The specific name is a noun in apposition meaning the West.

MALE

Measurements. Based on holotype and 4 males, holotype listed first, range of all follows: carapace length 3.10 mm, 3.10-3.55 mm; carapace width 2.05 mm, 2.05-2.35 mm; carapace index 67, 65-68; sternum length 1.40 mm, 1.35-1.60 mm; sternum width 1.10 mm, 1.10-1.30 mm; sternum index 81, 81-88.

Femur IV length 2.60 mm, 2.60-2.90 mm; femur IV width 0.65 mm, 0.65-0.80 mm; leg thickness index 25, 24-28; leg length index 81, 80-86.

Abdomen length 3.55 mm, 3.55-4.20 mm; abdomen width 1.75 mm, 1.55-2.25 mm; abdomen index 49, 46-55.

Embolus length 0.17 mm, 0.17-0.20 mm; bulb length 1.03 mm, 1.03-1.16 mm; male genital index 17, 16-17.

←

Map 6. Abdominal pattern variation in *Castianeira descripta*. (The white area on each represents the red-orange posterior spot.)

Description. Carapace red-brown and covered with dense hairs—a wide longitudinal median band of white hairs, with dark hairs on the sides, and the thoracic region bordered with white hairs. Head narrow (cephalic width index 53–58) and smoothly truncated anteriorly. Small lighter spot just anterior to thoracic groove. Eyes moderately small, equal, and bordered in black. Thoracic groove moderate.

Abdomen a long oval with a full dorsal sclerite, at anterior end red-brown with white hairs but becoming orange with bright orange hairs on posterior three-fourths of abdomen, with a tongue of anterior coloration extending posteriorly along the median to the middle of the abdomen (Fig. 113). Epigastric sclerite orange-brown, and an almost full orange ventral sclerite. First pair of abdominal setae very thin, second pair thin.

Sternum shield-shaped and orange-brown, with moderately sparse setae.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal larger and the proximal smaller than the retromargin teeth. No distinct denticle present.

Coxae all yellow-orange. Trochanter IV notch moderate.

Femora all red-brown, with some black and white hairs. Rest of legs I and II yellow; rest of III—patella-tibia light red-brown, metatarsus and tarsus yellow; rest of IV red-brown, except tarsus yellow. Tibia I ventral spination: 3–2, moderate except proximal prolateral spine small. Legs fairly heavily hirsute.

Pedipalp with a short, blunt tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a moderately long, thin, and straight embolus (Figs. 98, 99).

FEMALE

Measurements. Based on 10 females: carapace length 3.15–4.00 mm; carapace width 2.15–2.75 mm; carapace index 65–71;

sternum length 1.50–1.75 mm; sternum width 1.20–1.50 mm; sternum index 82–88.

Femur IV length 2.75–3.20 mm; femur IV width 0.70–0.90 mm; leg thickness index 25–30; leg length index 77–87.

Abdomen length 3.95–6.35 mm; abdomen width 2.25–3.95 mm; abdomen index 54–75; dorsal sclerite length 0.30–0.65 mm; dorsal sclerite width 0.75–1.05 mm; dorsal sclerite index 113–290.

Description. Carapace orange-brown and covered with dense hairs—a moderately wide, longitudinal, median band of white hairs with dark hairs on the sides, and the thoracic region bordered with a thin band of white hairs (Fig. 114). Head narrow (cephalic width index 56–61) and smoothly truncated anteriorly. Eyes moderately small, equal, and bordered in black. Thoracic groove moderately strong.

Abdomen oval, with a small, red-brown dorsal sclerite and covered with dense hairs—two abbreviated horizontal white hair stripes surrounded by black hairs at anterior end, followed by a wide median stripe of brilliant orange hairs with black hairs on both sides (Fig. 115). Epigastric sclerite yellow. Ventrums cream colored with dark hairs. First pair of abdominal setae very thin and long, second pair thin.

Sternum shield-shaped, light brown, with thin setae.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal larger and proximal smaller than the retromargin teeth. No clear denticle present.

Coxae all light yellow-brown. Trochanter IV notch moderately small.

All femora yellow-brown with some black and white hairs. Rest of legs I and II light yellow-brown; rest of legs III and IV yellow-brown. Tibia I ventral spination: 3–2, strong and fairly long. Legs fairly heavily hirsute.

External epigynum with two small, widely separated, round openings (Fig. 97). Internal structure with rounded sper-

mathecae narrowing slightly to wide posterior necks (Fig. 96).

Diagnosis. *Castianeira occidentis* differs from other *descripta* group species in the longitudinal white band on its carapace and its somewhat longer, thinner spermathecal necks (Fig. 96).

Remarks. This species is very closely related to *C. descripta*.

Natural history. This species has been collected in dryish grass and mesquite in southeastern Arizona, as well as in the forested mountains up to 8000 feet. A white disclike egg case contained 16 first instar spiderlings.

C. occidentis is a fast running spider and possibly a mutillid wasp mimic.

Distribution. Southwestern U.S. and N. W. Mexico (Map 5).

Castianeira walsinghami (O. P.-Cambridge)

Figures 92–95, 122. Map 5.

Agroeca walsinghami O. P.-Cambridge, 1874, Proc. Zool. Soc. London 1874:416, ♂, from Oregon; in the Oxford Museum, examined.

Castaneira walsinghami; Simon, 1897, Histoire Naturelle des Araignées, II (1):167.

Castianeira walsinghami; Banks, 1910, Bull. U.S. Nat. Mus. 72:11.

MALE

Measurements. Based on holotype and 2 males, holotype listed first, range of all follows: carapace length 3.05 mm, 3.05–3.40 mm; carapace width 2.05 mm, 2.05–2.35 mm; carapace index 68, 68–70; sternum length 1.25 mm, 1.25–1.50 mm; sternum width 1.10 mm, 1.10–1.25 mm; sternum index 90, 82–90.

Femur IV length 2.50 mm, 2.50–2.70 mm; femur IV width 0.60 mm, 0.60–0.75 mm; leg thickness index 25, 25–27; leg length index 82, 80–82.

Abdomen length 3.30 mm, 3.30–3.65 mm; abdomen width 1.75 mm, 1.60–2.05 mm; abdomen index 53, 47–56.

Embolus length 0.16 mm, 0.16 mm; bulb length 1.04 mm, 1.04–1.09 mm; male genital index 16, 15–16.

Description. Lightly pigmented specimen. Light orange-brown carapace with black and white plumose hairs—white hairs along center, longer in the cephalic region. Eyes moderately small, equal, and bordered in black. Carapace narrows in head region (cephalic width index 51–52) and is truncated smoothly anteriorly. Thoracic groove moderately strong.

Abdomen a long oval with an almost full dorsal sclerite with white hairs at anterior end and mostly orange-red plumose hairs on the rest, with a longitudinal band of darker hairs down anterior part of midline (many hairs rubbed off). A pair of light pigment spots just anterior to middle and almost meeting to produce a wide horizontal band. Light yellow-brown epigastric and almost full ventral sclerites. A long white spot on each side of abdomen. First pair of abdominal setae very thin, second pair thin.

Sternum orange with moderately dense, thin setae.

Chelicerae orange-brown with two moderate retromargin teeth and two promargin teeth, the distal longer and the proximal smaller than the retromargin teeth. No distinct denticle present.

Coxae all light yellow. Trochanter IV notch moderate.

Femora all light yellow. Rest of legs I and II light yellow; rest of legs III and IV light yellow-brown, with leg IV slightly darker, especially metatarsus IV. Legs moderately hirsute. Tibia I ventral spination: 2–2, moderate.

Pedipalp with a short, blunt apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a moderately long, thin, and straight embolus (Figs. 94, 95).

FEMALE

Measurements. Based on 4 females: carapace length 3.65–4.05 mm; carapace width 2.45–2.75 mm; carapace index 67–69; sternum length 1.65–1.75 mm; sternum width 1.40–1.55 mm; sternum index 84–89.

Femur IV length 2.95–3.20 mm; femur IV width 0.80–0.85 mm; leg thickness index 26–27; leg length index 79–82.

Abdomen length 3.75–5.60 mm; abdomen width 2.30–4.10 mm; abdomen index 61–76; dorsal sclerite length 0.55–0.95 mm; dorsal sclerite width 0.95–1.20 mm; dorsal sclerite index 124–206.

Description. Light orange-brown carapace with some black and white plumose hairs. Eyes moderately small, equal, and bordered in black. Carapace narrows in head region (cephalic width index 57–60) and is smoothly truncated anteriorly. Thoracic groove moderate.

Abdomen oval, with a small, anterior, orange dorsal sclerite and a hair pattern (many hairs rubbed off) of white hairs at anterior end and horizontal bands of orange plumose hair surrounded by brown-black hairs, with a large band (split in middle) just anterior to middle, followed and connected to two bands (fused in middle) and a posterior, longitudinal bar. Light yellow-brown epigastric sclerite. First pair of abdominal setae very thin, second pair thin.

Sternum yellow-brown with moderately dense, thin setae.

Chelicerae light orange-brown, with two moderate retromargin teeth and two promargin teeth, the distal longer and the proximal smaller than the retromargin teeth. No distinct denticle present.

Coxae all light yellow-brown. Trochanter IV notch moderate.

Femora all yellow. Rest of legs I and II light yellow; rest of legs III and IV light yellow-brown, with leg IV slightly darker, especially metatarsus IV. Legs moderately hirsute. Tibia I ventral spination: 3–2, long and strong.

External epigynum with two small circular openings (Fig. 93). Internal structure with two rounded, sac-like spermathecae with wide posterior necks (Fig. 92).

Diagnosis. *Castianeira walsinghami* dif-

fers from other *descripta* group species in its distinctive abdominal pattern.

Remarks. This is closely related to the preceding two species.

Natural history. *C. walsinghami* is found under stones in coniferous forest (Worley, 1932).

Distribution. Oregon and Washington (Map 5).

Records. Oregon. Washington. San Juan Co.

Castianeira crucigera (Hentz)

Figures 62–65, 86, 87. Map 5.

Herpyllus cruciger Hentz, 1847, Boston J. Nat. Hist. Soc. 5:458, pl. 24, fig. 11, ♀, from North Carolina; lost.

Castianeira crucigera: Chamberlin and Ivie, 1944, Bull. Univ. Utah 35(9) Biol. Ser. 8(5):180, fig. 20 (Abbot 458), ♂.

MALE

Measurements. Based on 3 males: carapace length 3.10–3.20 mm; carapace width 2.05–2.10 mm; carapace index 65–67; sternum length 1.40–1.45 mm; sternum width 1.10–1.20 mm; sternum index 78–84.

Femur IV length 2.45–2.60 mm; femur IV width 0.70–0.75 mm; leg thickness index 27–30; leg length index 78–82.

Abdomen length 3.40–3.60 mm; abdomen width 1.65–1.85 mm; abdomen index 48–52.

Embolus length 0.15–0.18 mm; bulb length 0.99–1.03 mm; male genital index 15–18.

Description. Carapace dark red-brown, covered with dense, short, white hairs. Carapace moderately narrow in head region (cephalic width index 54–60) and smoothly but distinctly truncated anteriorly. Eyes small and approximately equal. Thoracic groove moderately strong and short.

Abdomen oval, with four-fifths full, dark red-brown, dorsal sclerite and a black and white hair pattern—a wide longitudinal white hair band narrowing posteriorly, with two median dark spots in the band, one a quarter way from anterior end and a smaller one halfway back (Fig. 86). An

anterior white hair spot on each side of abdomen. Ventral abdomen with a wide, rectangular, dark red-brown sclerite narrowing posteriorly and extending about two thirds of the way from epigastric furrow to spinnerets. No inframammillary sclerite present. Both pairs of abdominal setae thin.

Sternum red-brown and covered with fairly dense, short, white hair, as well as the typical long setae. Pedicel short.

Chelicerae deep red-brown, with two moderate retromargin teeth (the distal slightly longer) and two promargin teeth—the distal somewhat larger and the proximal much smaller than the retromargin teeth, with a very small, but clear, denticle just distal to the larger promargin tooth.

Coxae all red-brown but lighter at distal tips. Rest of legs I and II yellow-white; rest of leg III yellow-brown, but with longitudinal stripes of brown and yellow on patella-tibia, and tarsus lighter; rest of leg IV red-brown, with patella-tibia also striped as in leg III, and tarsus yellow-brown. Legs quite heavily hirsute. Tibia I ventral spination: 2-2, moderately small.

Pedipalp with low rounded apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a straight, moderately thin, and long embolus coming to a point (Figs. 64, 65).

FEMALE

Measurements. Based on 2 females: carapace length 2.75–3.70 mm; carapace width 1.90–2.40 mm; carapace index 65–69; sternum length 1.20–1.60 mm; sternum width 1.05–1.30 mm; sternum index 82–87.

Femur IV length 2.30–2.85 mm; femur IV width 0.65–0.85 mm; leg thickness index 28–30; leg length index 77–85.

Abdomen length 3.30–4.30 mm; abdomen width 1.90–2.45 mm; abdomen index 57; dorsal sclerite width 0.95–1.05 mm.

Description. Carapace red-brown, covered with white hairs, longer on head. Eyes fairly small, about equal, and ocular region black. Carapace narrower in head region

(cephalic width index 53–55) and smoothly truncated anteriorly. Thoracic groove moderately strong and short.

Abdomen oval, with a small, red-brown, anterior dorsal sclerite and a black and white hair pattern—basically a complete, longitudinal, median white hair band narrowing posteriorly and spreading laterally in three bands, two at anterior end and one median, and two dark spots within the longitudinal band, a large one anterior to median band, and one at the level of the median band (Fig. 87). Wide white hair bands on both sides of abdomen. Epigastric sclerite red-brown. Ventral abdomen with four parallel, beaded stripes, two from ends of epigastric furrow and two more median, continuing posteriorly to spiracular furrow. Both pairs of abdominal setae very thin.

Sternum red-brown, with long, thin setae and shorter hairlike setae.

Chelicerae red-brown, with two moderate retromargin teeth (the distal slightly larger) and two promargin teeth—the distal somewhat larger and the proximal smaller than the retromargin teeth, with a small, but clear, denticle just distal to the larger promargin tooth.

Coxae all light yellow-brown. Trochanter IV notch moderate.

Femora reddish brown. Rest of legs I and II deep yellow-brown; rest of legs III and IV red-brown, lightening at distal ends of femora, patellae, and tibiae. Legs quite heavily hirsute, with black and white hairs. Tibia I ventral spination: 3-2, moderately long and strong.

External epigynum with two small, round openings widely separated (Fig. 63). Internal structure with moderately globose spermathecae narrowing somewhat posteriorly (Fig. 62).

Diagnosis. *Castianeira crucigera* differs from all other *Castianeira* in its abdominal pattern.

Remarks. This striking species is rediscovered and redescribed here. Chamberlin and Ivie (1944) note the illustration of this

species by Abbot (1792, No. 458), but the dark spots on the head of Abbot's drawing are not present in the species or in Hentz's (1847) more accurate drawing.

Castianeira crucigera in its female genitalia is somewhat intermediate in structure between the *descripta* group and the *longipalpus* group, but the small openings and thick spermathecal necks place it with the former group.

Natural history. *Castianeira crucigera* is found in the non-forest maritime communities of North Carolina (Barnes, 1953a, where *C. vulnerea* is actually *C. crucigera*) and throughout the South. Hentz (1847) reported that this species moves "with great celerity, and hides under stones, etc."

Distribution. Southeastern U.S. (Map 5).

Records. Arkansas. Conway Co. North Carolina. Cartaret Co. Virginia. Fairfax Co.

Castianeira vulnerea Gertsch

Figures 46–49, 81. Map 5.

Castianeira vulnerea Gertsch, 1942, Amer. Mus. Novit. No. 1195:7, figs. 22–23, ♂, ♀. Male holotype from Coney Island, New York; in the American Museum of Natural History, examined.

MALE

Measurements. Based on one male holotype: carapace length 2.10 mm; carapace width 1.50 mm; carapace index 72; sternum length 0.95 mm; sternum width 0.85 mm; sternum index 87.

Femur IV length 1.80 mm; femur IV width 0.45 mm; leg thickness index 25; leg length index 86.

Abdomen length 2.45 mm; abdomen width 1.25 mm; abdomen index 51.

Embolus length 0.11 mm; bulb length 0.77 mm; male genital index 15.

Description. Carapace deep orange-brown with white hairs. Eyes small, about equal, and bordered in black. Carapace narrower in head region (cephalic width index 57) and smoothly truncated anteriorly. Thoracic groove moderately strong.

Abdomen elongated oval with an almost full, orange dorsal sclerite covered with some partially rubbed off bands of white hair. Sides of abdomen with three white hair spots joined into a lateral-ventral white hair stripe. Ventral abdomen with a dark yellow rectangular sclerite about two-thirds of the way from epigastric furrow to spiracular furrow. No inframammillary sclerite present. Epigastric sclerite red-brown. Anterior abdominal setae thin, posterior pair stouter.

Sternum red-brown with sparse, thin setae. Pedicel very small.

Chelicerae deep orange-brown, with two moderate retromargin teeth (the distal slightly longer) and two promargin teeth, the distal one larger and the proximal one slightly smaller than the retromargin teeth; a very small denticle just distal and median to the distal promargin tooth.

Coxae all light yellow-brown. Trochanter IV notch moderate.

Femora red-brown; rest of legs I and II deep yellow; rest of leg III orange-brown; rest of leg IV red-brown, slightly lighter at the distal ends of the patella and tibia. Legs moderately hirsute. Tibia I ventral spination: 2–2, moderate, proximal retro-lateral spine smaller.

Pedipalp with a small, blunt, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a fairly short, straight, and fairly thin embolus (Figs. 48, 49).

FEMALE

Measurements. Based on one female (paratype): carapace length 2.60 mm; carapace width 1.80 mm; carapace index 69; sternum length 1.20 mm; sternum width 1.05 mm; sternum index 89.

Femur IV length 2.20 mm; femur IV width 0.60 mm; leg thickness index 28; leg length index 85.

Abdomen length 3.25 mm; abdomen width 2.05 mm; abdomen index 62; dorsal sclerite width 0.80 mm.

Description. Carapace orange-brown, with white hairs. Eyes small, about equal, and bordered in black. Carapace narrower in head region (cephalic width index 55) and smoothly truncated anteriorly. Thoracic groove moderately strong.

Abdomen oval, with a small orange-brown sclerite and a white and brown-black dorsal hair pattern—three horizontal white hair bands along median line, first and second joined at median, and not continuing to sides, then a complete horizontal band of white hairs, followed by a longitudinal band of white hairs (not continuous anteriorly) to the spinnerets (Fig. 81). Abdomen with a white hair stripe and three spots along its dorsal side. Ventrums with brown hairs. No inframammillary sclerite. Anterior abdominal setae hairlike, posterior pair very thin.

Sternum orange-brown, with long, thin setae. Pedicel very small.

Chelicerae orange, with two moderate retromargin teeth (the distal slightly longer) and two promargin teeth, the distal one larger and the proximal one slightly smaller than the retromargin teeth; a very small denticle just distal and median to the distal promargin tooth.

Coxae all light yellow. Trochanter IV notch moderate.

Femora light red-brown; rest of legs I and II dark yellow; of leg III yellow-brown; leg IV light red-brown, lighter at distal ends of patella and tibia. Legs moderately hirsute. Tibia I ventral spination: 3-2, moderate, proximal prolateral spine much smaller.

External epigynum with two fairly small, round openings (Fig. 46). Internal structure with rounded spermathecae and narrowed, slightly folded necks (Fig. 47).

Diagnosis. *Castianeira vulnerea* differs from other *longipalpus* group species in its abdominal pattern and internal epigynum; the spermathecal necks are fairly thick and turned inward (Fig. 47).

Remarks. This species is closely related

to *Castianeira crucigera*, the genitalia very similar in both the males (Figs. 48, 64) and the females (Figs. 47, 62). The abdominal patterns are quite different, but the scarcity of available *C. vulnerea* prevents a study of the possible north to south variation. The female genitalia of *C. vulnerea* more closely resemble those of *C. descripta* than do those of *C. crucigera*.

Natural history. Nothing is known of the habits of this species.

Distribution. New York (Map 5).

Records. New Jersey. Essex Co. New York. Kings Co.

THE GERTSCHI GROUP

Castianeira gertschi Kaston

Figures 104-107, 120. Map 7a.

Castianeira aurata: Emerton, 1913, Bull. Amer. Mus. Nat. Hist. 32:258, pl. 48, figs. 8-8b, ♂, ♀. (Not *Herpyllus? auratus* Hentz.)

Castianeira gertschi Kaston, 1945, Amer. Mus. Novit. No. 1290:6, figs. 27-29, ♂, ♀. Male holotype from Indian Neck, Connecticut; in the American Museum of Natural History, examined.

MALE

Measurements. Based on holotype and 6 males, holotype listed first, range of all follows: carapace length 2.50 mm, 2.00-2.50 mm; carapace width 1.60 mm, 1.20-1.60 mm; carapace index 64, 61-64; sternum length 1.20 mm, 0.95-1.20 mm; sternum width 0.75 mm, 0.70-0.85 mm; sternum index 62, 62-77.

Femur IV length 2.05 mm, 1.65-2.15 mm; femur IV width 0.50 mm, 0.35-0.50 mm; leg thickness index 23, 21-23; leg length index 83, 82-90.

Abdomen length 2.75 mm, 2.15-2.75 mm; abdomen width 1.20 mm, 1.00-1.20 mm; abdomen index 44, 39-47.

Embolus length 0.11 mm, 0.10-0.11 mm; bulb length 0.86 mm, 0.75-0.86 mm; male genital index 13, 12-13.

Description. Carapace yellow-orange and hairless. Eyes fairly small, equal, and bordered in black. Carapace narrow in head region (cephalic width index 50-55)

and smoothly truncated anteriorly. Thoracic groove moderate.

Abdomen an elongated oval, with a complete dorsal sclerite yellow at anterior end and gradually darkening to a dark brown at posterior end and crossed by three lighter bands (reinforced with white hairs), the most posterior being median and split in the middle (Fig. 120). Light red-brown epigastric sclerite. Elongated, rectangular, yellow ventral sclerite from epigastric furrow to a small inframamillary sclerite. Anterior abdominal setae very thin, posterior pair considerably stouter.

Sternum yellow, with very sparse, thin setae. Pedicel very small.

Chelicerae dark yellow, with two moderate retromargin teeth and two promargin teeth, the distal one much larger and the proximal one smaller than the retromargin teeth; with a small but clear denticle just distal and medial to the larger promargin tooth.

Coxae deep yellow. Trochanter IV notch moderate.

Femora all yellow-orange. Rest of legs I and II light yellow; of leg III deep yellow; leg IV patella yellow-orange, tibia red-brown, metatarsus darker red-brown, tarsus orange-brown. Legs moderately hirsute. Tibia I ventral spination: 2-2.

Pedipalp with moderate, pointed, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a short, fairly thin embolus with a clear twist at the tip (Figs. 106, 107).

FEMALE

Measurements. Based on 5 females: carapace length 2.35-2.85 mm; carapace width 1.40-1.80 mm; carapace index 59-63; sternum length 1.05-1.30 mm; sternum width 0.80-0.95 mm; sternum index 68-76.

Femur IV length 2.05-2.25 mm; femur IV width 0.40-0.60 mm; leg thickness index 20-26; leg length index 83-88.

Abdomen length 2.80-3.85 mm; abdomen width 1.15-2.50 mm; abdomen index 41-

68; dorsal sclerite length 0.55-0.65 mm; dorsal sclerite width 0.55-0.70 mm; dorsal sclerite index 85-117.

Description. Carapace deep yellow-orange and hairless. Eyes fairly small, equal, and bordered in black. Carapace narrow in head region (cephalic width index 55-60) and smoothly truncated anteriorly. Thoracic groove moderately strong.

Abdomen oval with a moderately small, yellow, anterior dorsal sclerite; abdomen darkening to dark brown at posterior end. Epigastric sclerite yellow-orange. Anterior abdominal setae long and very thin; posterior pair shorter and stouter. (Vague horizontal stripes on abdomen.)

Sternum yellow, with very sparse, long, thin setae.

Chelicerae dark yellow, with two moderate retromargin teeth and two promargin teeth, the distal one much larger and the proximal one smaller than the retromargin teeth; with a small but clear denticle just distal and medial to the larger promargin tooth.

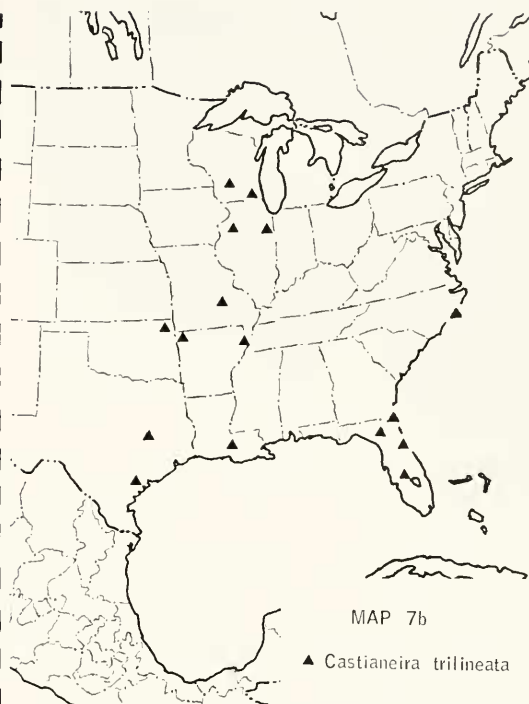
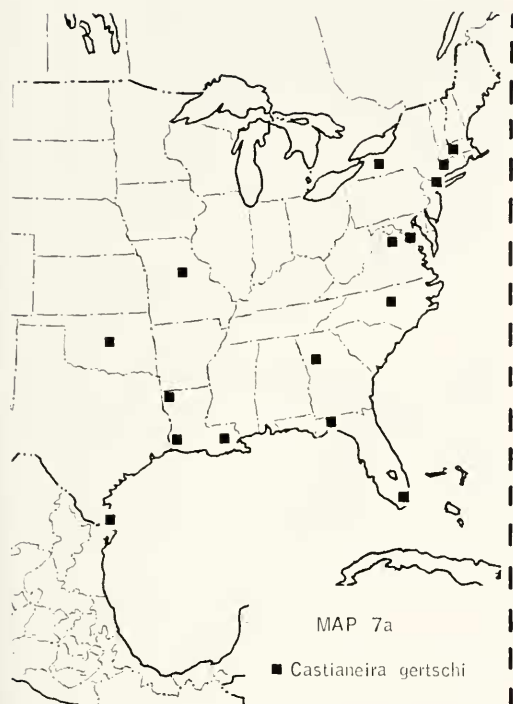
Coxae all deep yellow. Trochanter IV notch moderate.

Femora I and II deep yellow, rest of legs I and II light yellow. Femur and patella-tibia III deep yellow, rest of leg III yellow-brown; femur and patella-tibia IV yellow-orange (darkening to red-brown at distal end of tibia), metatarsus and tarsus deep red-brown. Legs moderately hirsute. Tibia I ventral spination: 2-2, strong.

External epigynum with two flared openings (Fig. 105). Internal structure with globose spermathecae having narrow posterior necks (Fig. 104).

Diagnosis. This moderately small spider differs from other *Castianeira* in its abdomen, which darkens posteriorly from yellow to dark brown, often having three horizontal stripes (Fig. 120). Genitalic differences distinguish it from the larger *Castianeira trilineata*.

Remarks. *Castianeira gertschi* is the



name given to a species previously known as *Castianeira aurata* (Hentz) (e. g. described by Emerton in 1913). Kaston (1945) noted that *Herpyllus auratus* Hentz, on which the old name was based, was actually a *Micaria*; therefore a new name was in order.

Natural history. Nothing is known of the habits of this species.

Distribution. Southern New England to the southeastern U.S. (Map 7a).

THE TRILINEATA GROUP

Castianeira trilineata (Hentz)

Figures 108–110, 119. Map 7b.

Herpyllus trilineatus Hentz, 1847, Boston J. Nat. Hist. Soc. 5:460, pl. 24, fig. 18, ♀, from Alabama; lost.

Thargalia trilineata: Marx, 1889, Proc. U.S. Nat. Mus. 12:514.

Castianeira trilineata: Banks, 1910, Bull. U.S. Nat. Mus. 72:11.

Castianeira stupkai Barrows, 1940, J. Ohio Sci. 40(3):137, figs. 10, 10b, 10c, ♂, ♀. Male

holotype from Gatlinburg, Tennessee; in the Ohio State University Museum, examined. NEW SYNONYMY.

Castianeira trilineata: Kaston, 1948, Connecticut Geol. and Nat. Hist. Surv. Bull. 70:397, figs. 1423, 2123, ♂, ♀.

MALE

Measurements. Based on 10 males: carapace length 2.50–3.05 mm; carapace width 1.50–1.85 mm; carapace index 59–62; sternum length 1.10–1.40 mm; sternum width 0.80–1.05 mm; sternum index 73–81.

Femur IV length 1.90–2.55 mm; femur IV width 0.35–0.50 mm; leg thickness index 18–22; leg length index 75–89.

Abdomen length 2.75–3.50 mm; abdomen width 1.20–1.75 mm; abdomen index 44–55.

Bull length 0.95–1.10 mm.

Description. Carapace orange-brown and hairless. Eyes moderate and equal. Carapace narrower in head region (cephalic

width index 48–53) and rounded anteriorly. Thoracic groove fairly weak.

Abdomen a slightly pear-shaped oval, widening posteriorly and covered by a full, red-brown dorsal sclerite with a thin horizontal light yellow band across midline and some horizontal yellow-brown abbreviated stripes at anterior end (Fig. 119). Epigastric sclerite red-brown. Rectangular, red-brown ventral sclerite from epigastric furrow to a small brown inframammillary sclerite. First pair of abdominal setae long and hair-like, second pair stout and moderately thick.

Sternum orange-brown, with very sparse, thin setae. Pedicel small.

Chelicerae light orange-brown, with two moderately small retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; with a minute denticle just medial and distal to the larger promargin tooth.

Coxa I brown, coxae II–IV yellow-white. Trochanter IV notch moderate.

Femora I red-brown, II and III striped with red-brown lateral sides and yellow dorsal and ventral sides, and IV with red-brown lateral sides, and a medial dorsal stripe; rest of I and II yellow-white with distal ends of metatarsi brown; rest of III yellow with patella-tibia and metatarsus striped like femur; rest of IV with striped patella-tibia, brown metatarsus, and yellow tarsus. Legs lightly hirsute. Tibia I ventral spination: 3–2, small.

Pedipalp with a small tibial apophysis. Tarsus with a globose genital bulb drawn into a short neck with a complex twisted embolus and conductor end (Fig. 110).

The basal portion of the lateral side of the cymbium bears a heavy spine.

FEMALE

Measurements. Based on 10 females: carapace length 2.70–3.65 mm; carapace width 1.65–2.40 mm; carapace index 59–64; sternum length 1.20–1.65 mm; sternum

width 0.95–1.30 mm; sternum index 77–82.

Femur IV length 2.20–3.25 mm; femur IV width 0.40–0.65 mm; leg thickness index 14–23; leg length index 80–92.

Abdomen length 3.20–4.50 mm; abdomen width 1.95–3.05 mm; abdomen index 54–70; dorsal sclerite length 0.70–1.10 mm; dorsal sclerite width 0.75–0.95 mm; dorsal sclerite index 88–138.

Description. Carapace light yellowish-brown (head region slightly darker) and hairless. Eyes moderate, bordered in black, and equal. Carapace narrower in head region (cephalic width index 54–58) and smoothly truncated anteriorly. Thoracic groove fairly weak.

Abdomen oval, with a moderate, brown dorsal sclerite, dark black-brown with three thin horizontal bands—two thin yellow-white bands, one through the sclerite, one at middle of abdomen, and one wider, dark yellow-brown band near the posterior end. Epigastric sclerite light brown on sides, cream colored along midline. Ventrums dark brown with four longitudinal, light, beaded stripes from epigastric furrow to a moderately small, brown inframammillary sclerite. First pair of abdominal setae hair-like, second pair thin.

Sternum yellow-white with sparse, thin setae. Pedicel very small.

Chelicerae light yellow-brown, with two moderately small retromargin teeth (the distal one slightly larger) and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; with a minute denticle just medial and distal to the larger promargin tooth.

Coxae all light yellow. Trochanter IV notch very shallow.

Femora I and II with brown lateral sides, femora III and IV with very light brown lateral sides; rest of legs I and II yellow-white, of leg III light yellow, of leg IV yellow, with darker tibia and metatarsus. Tibia I ventral spination: 3–3, moderate spines. Legs lightly hirsute.

External epigynum with two wide, flared openings (Fig. 109). Internally with rounded spermathecae and narrow, slightly sinuous posterior necks (Fig. 108).

Diagnosis. The males of *Castianeira trilineata* differ from all other *Castianeira* in their short, twisted embolus (Fig. 110). The females have a hairless carapace, flared epigynal openings, and a distinctive abdominal pattern of three horizontal light bands.

Remarks. There is a great deal of color variation in *C. trilineata*, with a very dark brown form occurring in the middle of Florida and a yellow to orange form occurring elsewhere (northern Florida, Missouri, Illinois, etc.).

Natural history. *Castianeira trilineata* is found in sandy places, under dead leaves on Long Island (Banks, 1895), in non-forest maritime communities of North Carolina (Barnes, 1953b), on the ground stratum of river-terrace forest of western Tennessee (Gibson, 1947), in black oak forest in the Chicago area dunes (Lowrie, 1948, Fitch, 1963), and in an *Andropogon* field of eastern Tennessee (Barrows, 1940).

Gibson (1947) reports this species hatching in middle August and maturing in late July, the spiders overwintering in the egg case as eggs or very young. Fitch (1963) notes that "in size, coloration and behavior it resembles the carpenter ant, *Camponotus castaneus*, which is common in the same habitat." One specimen was collected with a worker of *Formica pallidefulva* in Missouri.

Distribution. Eastern U.S. (Map 7b).

THE CINGULATA GROUP

Castianeira cingulata (C. L. Koch)

Frontispiece. Figures 100–103, 116–118.
Map 7c.

Corinna cingulata C. L. Koch, 1842, Die Arachniden 9:22, fig. 706, ♀, from Pennsylvania; lost.

Herpyllus zonarius Hentz, 1847, Boston J. Nat. Hist. Soc. 5:460, pl. 24, fig. 17, ♀, from Alabama; lost.

Sparassus cingulata: Walckenaer, 1847, Histoire Naturelle des Insectes Aptères 4:562.

Thargalia cingulata: Karsch, 1880, Z. Ges. Nat. 53:376. Marx, 1889, Proc. U.S. Nat. Mus. 12: 513. Marx, 1892, Proc. Entomol. Soc. Washington 2(2):155.

Liocranum zonarium: Marx, 1883, Araneina, in Howard, L. O., A List of the Invertebrate Fauna of South Carolina, Charleston, p. 23.

Castianeira bivittata Keyserling, 1887, Verhandl. Zool. Bot. Ges. Wien 37:442, pl. 6, fig. 16, ♀, from Cambridge, Massachusetts; in the Museum of Comparative Zoology, examined.

Geotrecha bivittata: Emerton, 1889, Trans. Connecticut Acad. Sci. 8(9):169, pl. 3, fig. 3, ♂, ♀. Emerton, 1902, The Common Spiders of the United States, Boston, p. 8, fig. 23–24.

Thargalia zonaria: Marx, 1889, Proc. U.S. Nat. Mus. 12:514.

Thargalia bivittata: Marx, 1889, Proc. U.S. Nat. Mus. 12:513.

Castaneira cingulata: Simon, 1897, Histoire Naturelle des Araignées, II, fasc. 1:172. Petrunkevitch, 1911, Bull. Amer. Mus. Nat. Hist. 29: 452.

Thargalia canadensis Banks, 1897, Canadian Entomol. 29:194, ♀, from Ottawa, Canada; in the Museum of Comparative Zoology, examined. (First synonymized by Emerton, 1920, Trans. Roy. Canadian Inst. 12:332 as *Micaria cingulata*.)

Castianeira cingulata: Banks, 1910, Catalogue of Nearctic Spiders, Bull. U.S. Nat. Mus. 72:11 (= *bivittata* = *zonaria*). Chickering, 1939, Pap. Michigan Acad. Sci. 24(2):57, figs. 17–19, ♂, ♀. Kaston, 1948, Connecticut Geol. and Nat. Hist. Surv. Bull. 70:394, figs. 1401, 1408, 1424–1425, ♂, ♀.

MALE

Measurements. Based on 10 males: carapace length 2.80–3.40 mm; carapace width 1.70–2.05 mm; carapace index 59–63; sternum length 1.15–1.45 mm; sternum width 0.95–1.10 mm; sternum index 75–81.

Femur IV length 1.95–2.60 mm; femur IV width 0.45–0.60 mm; leg thickness index 22–25; leg length index 67–81.

Embolus length 0.22–0.26 mm; bulb length 1.30–1.57 mm; male genital index 16–18.

Description. Carapace rounded anteriorly (Fig. 116) (cephalic width index 48–49) and very dark maroon, with fairly long, simple, white hairs on cephalic region and

some light hairs covering triangle made by posterior truncation of carapace and thoracic groove. Eyes moderately small and equal. Thoracic groove moderate.

Abdomen oval, widening posteriorly, and covered with a dark maroon dorsal sclerite and two narrow, horizontal, lighter pigmented stripes, the anterior one at one fourth and the posterior one at one half the length of the abdomen (Fig. 117). Both bands reinforced by long, simple, white hairs. Rest of abdomen covered by dark hairs. Epigastric sclerite red-brown. Ventral sclerite rectangular and red-brown, running from epigastric furrow posteriorly and ending in semicircle around an orange-brown inframillary sclerite. Anterior pair of dorsal abdominal setae long and very thin, posterior pair shorter and stouter.

Sternum red-brown, with sparse, very long setae. Pedicel short.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small denticle distal and medial to larger promargin tooth.

Coxa I light brown, coxae II, III, and IV yellow-white. Trochanter IV with a shallow notch.

Femora of all legs striped—both lateral sides and dorsal stripe dark brown, rest of femora dark yellow or orange. The resulting light stripes reinforced with white hairs on femora II, III, and IV. Tibiae III and IV similarly striped, and sides of patellae III and IV dark brown; metatarsus IV dark brown; rest of legs I and II yellow-white, of leg III dark yellow, of leg IV orange. Legs lightly hirsute with moderate spination. Tibia I ventral spination: 3–2, small.

Pedipalp with a negligible tibial apophysis. Tarsus with globose genital bulb drawn out into long neck with a club-shaped sclerotized embolus having a very strongly spiraled tip (Figs. 102, 103).

FEMALE

Measurements. Based on 11 females: carapace length 3.10–3.75 mm; carapace width 2.00–2.40 mm; carapace index 62–65; sternum length 1.40–1.65 mm; sternum width 1.10–1.30 mm; sternum index 74–80.

Femur IV length 2.40–2.95 mm; femur IV width 0.60–0.70 mm; leg thickness index 23–25; leg length index 75–83.

Description. Carapace maroon, with sparse white hairs in cephalic region. Carapace narrow in head region (cephalic width index 54–60) and smoothly truncated anteriorly. Ocular region darker. Eyes moderate and equal. Thoracic groove moderate.

Abdomen rounded oval, with a small, red-brown dorsal sclerite; two thin, light pigmented, horizontal bands, one crossing the dorsal sclerite, the other about one fourth abdominal length from anterior end. White hairs reinforce pigment bands and dark hairs cover grey basal color of rest of abdomen (Fig. 115). Epigastric sclerite red-brown. Two light pigmented lines of beaded stripes running parallel from sides of epigastric furrow to area on sides of posterior spiracular furrow. Anterior pair of dorsal abdominal setae long and hairlike, posterior pair shorter and fairly thick (arising from the dorsal scutum).

Sternum red-brown, shield-shaped, with long, thin setae. Pedicel fairly short.

Chelicerae dark brown, with two moderately large retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small denticle distal and medial to the larger promargin tooth.

Coxa I brown, coxae II and III yellow, and coxa IV dark yellow. Trochanter IV with shallow notch.

Femora of all legs striped—both lateral sides and dorsal stripes dark brown, rest of femora yellow. Resulting dorsal yellow stripes reinforced with white hairs on femora III and IV. Tibiae III and IV simi-

larly striped (the former weakly); metatarsus IV dark brown; rest of legs I and II yellow, rest of leg III orange, and of leg IV orange-brown. Legs lightly hirsute, with moderate spination. Tibia I ventral spination: 3-2, moderately thin and long.

External epigynum with widely flared openings (Fig. 101). Internal structure with a pair of saclike, rectangular, heavily sclerotized, and heavily reticulated spermathecae (Fig. 100).

Diagnosis. *Castianeira cingulata* differs from all other *Castianeira* in its distinct genitalia, abdomen with two thin horizontal bands, and strongly striped legs.

Remarks. A form of *C. cingulata* with a bicolored carapace (a dark brown cephalic region and an orange or yellow thoracic region) is found in northern Wisconsin, Minnesota, South Dakota, and Ontario (see Map 7c). Both forms occur together in Minnesota, and near one another in South Dakota. These two phenotypes may represent another example of genetic polymorphism in spiders.

Natural history. *Castianeira cingulata* is found in forest litter, beneath logs and stones and among leaves on the ground in Michigan (Chickering, 1939), under sandstone, under elm logs, in elm shrubbery in the prairies and forests of eastern Nebraska (Worley and Pickwell, 1931), in ground stratum of elm-maple forest in Illinois (Weese, 1924), in black oak and beech maple forest of the Chicago area dunes (Lowrie, 1948), on the ground among leaf mold in Ontario (Kurata, 1939), and in oak-hickory woodland in Kansas (Fitch, 1963).

C. cingulata hibernates in immature or adult form (Elliot, 1930), and adult females have been collected in eastern Massachusetts in December. Jones (1941) observed mature and immature specimens in the winter and one hibernating in an empty acorn shell. Kaston (1948) reports finding females in winter, spring, and summer, but males only in July and August.

Of four egg cases collected by Kaston (1948), one had 22 eggs, two had 24 eggs each, and one had 30 eggs.

Montgomery (1903) described the construction of the egg case, noting that after finishing the spinning, the spider "covered the surface . . . with small particles of dirt."

Truman (1942) reported *C. cingulata* running at night "in company with the large carpenter ants, which it closely resembles both in appearance and in action."

Distribution. Eastern and midwestern U.S. and Canada (Map 7c).

THE *DUGESII* GROUP

Characteristics. Moderately small (male carapace length 1.60-2.15 mm; female carapace length 1.90-2.85 mm), with a carapace index 61-69. Whole body almost hairless, with some light hairs on abdomen. Spermathecae with globose anterior ends and moderately thin posterior crooked necks. External epigynum with flared openings. Leg thickness index 18-26. Eyes approximately equal.

Remarks. This group is restricted to the dry regions in southwestern U.S. and northwestern Mexico and is characterized by its hairlessness and distinctive male genitalia.

Castianeira dugesii (Becker)

Figures 127, 128. Map 8.

Micariaulax dugesii Becker, 1879, Ann. Soc. Entomol. Belgium, 22:83, pl. 2, fig. 9, 10, ♂, from Guanajuato, Mexico; in the Brussels Museum, examined.

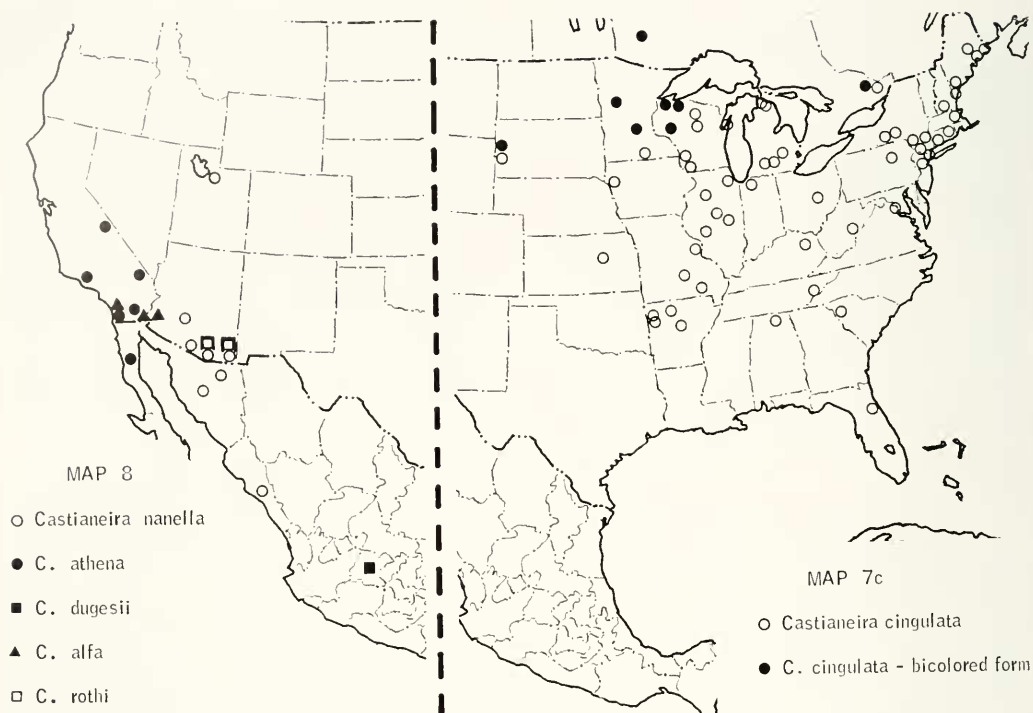
Castaneira dugesii: Simon, 1897, Histoire Naturelle des Araignées 2(1):167.

Castianeira dugesii: F. P.-Cambridge, 1899, Biol. Centrali-Americana Arachnida 2:81.

MALE

Measurements. Based on one male holotype: carapace length 2.05 mm; carapace width 1.30 mm; carapace index 63; sternum length 0.95 mm; sternum width 0.75 mm; sternum index 77.

Femur IV length 1.40 mm; femur IV



width 0.35 mm; leg thickness index 25; leg length index 69.

Abdomen length 2.60 mm; abdomen width 1.15 mm; abdomen index 45.

Embolus length 0.07 mm; bulb length 0.65 mm; male genital index 10.

Description. Carapace orange-brown and hairless, with anterior part of head region dark brown and dark streaking from thoracic groove outwards. Carapace moderately narrow in head region (cephalic width index 58) and smoothly truncated anteriorly. Eyes equal. Thoracic groove moderate.

Abdomen oval, with a full, dark red-brown dorsal sclerite, granulose at anterior end and gradually becoming smooth and shiny posteriorly. Rectangular red-brown sclerite on ventral abdomen. Both pairs of abdominal setae hairlike.

Sternum dark yellow with light, thin setae.

Chelicerae dark brown (like anterior part of carapace). Cheliceral teeth unexamined but probably similar to *C. nanella*.

Coxae all dark yellow. Trochanter IV notch moderate.

Femur I dark brown; rest of leg I and all of leg II light yellow; leg III yellow; leg IV dark yellow, with femur and tibia yellow-brown.

Pedipalp with a distinct tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck ending with an unpigmented embolus at a right angle near the tip (Fig. 127, 128).

Diagnosis. *Castianeira dugesii* differs from other *dugesii* group species in the right angle bend at the tip of its embolus.

Remarks. Only a single male is known of this species.

Natural history. Nothing is known of the habits of this species.

Distribution. Only known from the type locality in Guanajuato, Mexico (Map 8).

Records. MEXICO. *Guanajuato*.

***Castianeira nanella* Gertsch**

Figures 129–132, 149, 150. Map 8.

Castianeira nanella Gertsch, 1933, Amer. Mus. Novit. No. 637:6, fig. 3, ♂, from Salt Lake City, Utah; in the American Museum of Natural History, examined.

MALE

Measurements. Based on holotype and 9 males, holotype listed first, range of all follows: carapace length 1.85 mm, 1.75–2.30 mm; carapace width 1.20 mm, 1.15–1.40 mm; carapace index 64, 60–66; sternum length 0.95 mm, 0.90–1.05 mm; sternum width 0.75 mm, 0.70–0.80 mm; sternum index 77, 72–78.

Femur IV length 1.40 mm, 1.40–2.35 mm; femur IV width 0.30 mm, 0.30–0.35 mm; leg thickness index 22, 16–22; leg length index 74, 74–101.

Abdomen length 2.50 mm, 2.30–3.10 mm; abdomen width 1.20 mm, 1.10–1.25 mm; abdomen index 48, 40–51.

Embolus length 0.10 mm, 0.08–0.15 mm; bulb length 0.70 mm, 0.65–0.77 mm; male genital index 14, 12–19.

Description. Carapace dark yellowish brown and hairless. Eyes fairly large, equal, and bordered in black. Carapace narrow in head region (cephalic width index 53–57) and smoothly truncated anteriorly. Thoracic groove moderate.

Abdomen an elongated oval, with a full, shiny, dorsal sclerite—red-brown with a yellow pattern—an anterior horizontal band, a second band connected medially to a short third band, followed by a main horizontal band, followed, finally, by a short, abbreviated stripe. The posterior portion solid red-brown (Fig. 149). Epigastric sclerite orange. Yellow ventral sclerite from epigastric furrow about two thirds of the way to a small inframammillary sclerite. Anterior pair of abdominal setae very thin

and long, posterior pair short and very stout, spinelike.

Sternum dark yellow and hairless. Pedicel very small.

Chelicerae dark yellow-brown, with two moderately small retromargin teeth (the distal one slightly longer) and two promargin teeth, the distal one larger and the proximal one slightly smaller than the retromargin teeth; a small denticle just distal and median to the distal promargin tooth.

Coxa I yellow-brown, coxae II, III, and IV light yellow-brown. Trochanter IV notch not clear.

Legs not attached to type—but apparently femora striped (brown lateral sides and the rest yellow); rest of legs I and II yellow-white, rest of III yellow, with tibia striped. Legs lightly hirsute. Tibia I ventral spination: 3–2, moderate and thin.

Pedipalp with a short, sharp tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck having a thin embolus and a slight terminal twist (Figs. 131, 132).

FEMALE

Measurements. Based on 11 females: carapace length 1.90–2.60 mm; carapace width 1.20–1.60 mm; carapace index 61–64; sternum length 0.95–1.20 mm; sternum width 0.75–0.95 mm; sternum index 72–81.

Femur IV length 1.65–2.40 mm; femur IV width 0.30–0.45 mm; leg thickness index 18–20; leg length index 86–96.

Abdomen length 2.60–3.75 mm; abdomen width 1.40–2.25 mm; abdomen index 50–63; dorsal sclerite length 0.95–1.55 mm; dorsal sclerite width 0.65–1.15 mm; dorsal sclerite index 64–84.

Description. Carapace light yellow-brown and hairless. Eyes fairly large, bordered in black, and equal. Carapace narrow in head region (cephalic width index 53–59) and smoothly truncated anteriorly. Thoracic groove fairly weak.

Abdomen oval, with moderate, dark yellow-brown dorsal sclerite (about two-

fifths the length of the abdomen) and a light yellow and brown-black pattern—an anterior horizontal band of yellow, a second band connected medially to a short thin band that is connected medially to a major horizontal band, followed finally by a thin horizontal stripe. The posterior two fifths solid brown-black (Fig. 150). Epigastric sclerite yellow-brown. Ventrums light yellow. A small, red-brown inframammillary sclerite. First pair of abdominal setae long and very thin, second pair moderately heavy and short.

Sternum yellow-orange with sparse, thin setae. Pedicel very small.

Chelicerae yellow-brown, with two moderately large retromargin teeth and two promargin teeth, the distal one slightly larger and the proximal one smaller than the retromargin teeth; a small denticle just distal and medial to the larger promargin tooth.

Coxae all light yellow-brown. Trochanter IV notch moderately weak.

Femur I dark red-brown, femora II–IV striped, with red-brown lateral sides and yellow ventral and dorsal sides. Rest of legs I and II yellow, of leg III dark yellow; leg IV with dark yellow patella, tibia and metatarsus striped like femur, and tarsus yellow-brown. Tibia I ventral spination: 3–3, long and strong.

External female genitalia with a pair of wide, flared openings (Fig. 130). Internal structure with somewhat globose spermathecae drawn out into posterior necks having a distinct crook in them (Fig. 129).

Diagnosis. *Castianeira nanella* differs from other *dugesii* group species in its genitalia, leg thickness index (18–20), and abdominal pigmentation patterns.

Remarks. Two specimens having fewer dark markings on the abdomen and longer emboli (male genital index 17–19) occur in Mexico.

Natural history. This species has been

collected in the dry grass and mesquite regions of Arizona. One egg case collected contained seven eggs.

Distribution. Southwest U.S. and north-west Mexico (Map 8).

Records. *Arizona.* Cochise Co., Maricopa Co., Pima Co., Santa Cruz Co. *Utah.* Salt Lake Co.

MEXICO. Sinaloa. Sonora.

Castianeira alfa new species

Figures 123–126, 151. Map 8.

Holotype. Male from Brawley, Imperial Co., California, 13-VIII-1959 (E. Schlenger); in the American Museum of Natural History. The specific name is an arbitrary combination of letters.

MALE

Measurements. Based on holotype and 9 males, holotype listed first, range of all follows: carapace length 1.85 mm, 1.60–2.15 mm; carapace width 1.20 mm, 1.05–1.40 mm; carapace index 67, 62–67; sternum length 0.85 mm, 0.80–1.00 mm; sternum width 0.70 mm, 0.65–0.75 mm; sternum index 81, 78–85.

Femur IV length 1.40 mm, 1.10–1.60 mm; femur IV width 0.30 mm, 0.30–0.40 mm; leg thickness index 23, 23–26; leg length index 75, 68–76.

Abdomen length 2.30 mm, 1.90–2.75 mm; abdomen width 1.20 mm, 1.00–1.40 mm; abdomen index 51, 49–53.

Embolus length 0.08 mm, 0.07–0.09 mm; bulb length 0.63 mm, 0.60–0.70 mm; male genital index 13, 11–13.

Description. Carapace red-brown, with some sparse white hairs. Eyes moderately small, equal, and bordered in black. Carapace narrower in head region (cephalic width index 55–59) and smoothly truncated anteriorly. Thoracic groove moderate.

Abdomen oval (widening towards posterior) and covered by a full dorsal sclerite—bright red-brown, anterior three-quarters highly punctate, posterior quarter darker

and highly shiny. Whole dorsal sclerite covered with thin, light hairs. Epigastric and ventral sclerites full and red-brown. First pair of abdominal setae hairlike, second pair moderately thin.

Sternum light orange, with extremely sparse, thin setae. Pedicel very short.

Chelicerae orange, with two moderate retromargin teeth (the distal one slightly larger) and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A small denticle distal and medial to larger promargin tooth.

Coxae all dark yellow. Trochanter IV notch small.

Femur I dark brown, femora II–IV orange-brown (darker on lateral sides); rest of legs I and II light yellow, rest of leg III light orange-brown, rest of leg IV with patella-tibia orange-brown and slightly striped, metatarsus dark red-brown, and tarsus yellow-brown. Legs moderately hirsute. Tibia I ventral spination: 2–1, small (plus a very small proximal retrolateral spine).

Pedipalp with a rounded, short tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with a thin embolus, curved at the tip (Fig. 125, 126).

FEMALE

Measurements. Based on 7 females: carapace length 2.40–2.85 mm; carapace width 1.55–1.95 mm; carapace index 65–69; sternum length 1.10–1.30 mm; sternum width 0.85–1.05 mm; sternum index 77–83.

Femur IV length 1.70–2.20 mm; femur IV width 0.40–0.50 mm; leg thickness index 23–25; leg length index 72–78.

Abdomen length 2.85–4.30 mm; abdomen width 1.65–2.50 mm; abdomen index 52–62; dorsal sclerite width 1.20–1.65 mm.

Description. Carapace bright orange-brown and hairless. Eyes moderately small, equal, and bordered in black. Carapace narrower in head region (cephalic width

index 59–62) and smoothly truncated anteriorly. Thoracic groove moderate.

Abdomen oval with a moderate, punctate, orange-brown dorsal sclerite. Posterior half brown-black and anterior half light yellow, with a narrow brown-black horizontal band just anterior to the midline (Fig. 151). Epigastric sclerite red-brown. Ventrums pale yellow with some longitudinal brown-black markings from sides of epigastric furrow to a dark area around the spinnerets. First pair of abdominal setae hairlike, second pair moderately thin.

Sternum orange with sparse, thin setae. Pedicel very small.

Chelicerae orange, with two moderate retromargin teeth (the distal one slightly larger) and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A small denticle distal and medial to larger promargin tooth.

Coxae all light orange. Trochanter IV notch small.

Femur I dark brown; femora II–IV light orange-brown. Rest of legs I and II yellow-white; rest of III deep yellow; rest of IV light orange-brown. Legs lightly hirsute. Tibia I ventral spination: 2–1, small (plus a very small proximal retrolateral spine).

External epigynum with wide, flared openings (Fig. 124). Internal structure with globose spermathecae narrowing to thin, curved posterior necks (Fig. 123).

Diagnosis. *Castianeira alfa* differs from other *dugesii* group species in its male and female genitalia (a clear bend at the end of the embolus and small, curved spermathecal necks), and in the female abdominal pattern.

Natural history. The type locality is an alfalfa field. Nothing is known of the habits of this species.

Distribution. Southern California, Arizona, and probably adjacent areas in Mexico (Map 8).

Records. Arizona. Yuma Co. California. Imperial Co., San Diego Co.

THE ATHENA GROUP

Characteristics. Small (male carapace length 1.60–2.30 mm; female carapace length 2.15–2.85 mm), with moderately wide carapace (carapace index 63–68) and moderate cephalic region (male cephalic width index 53–54; female cephalic width index 55–64). Eyes moderately small and approximately equal. Thoracic groove moderate to weak. Carapace and abdomen moderately hirsute.

Discussion. *Castianeira athena* and *C. rothi* are closely related.

Castianeira athena new species

Figures 172–175, 275. Map 8.

Holotype. Male from Andreas Canyon, Palm Springs, Riverside Co., California, 26-III-1960 (W. J. Gertsch, Ivie and Schrammel); in the American Museum of Natural History. The specific name is a noun in apposition after the Greek goddess Athena.

MALE

Measurements. Based on one male holotype: carapace length 2.30 mm; carapace width 1.55 mm; carapace index 67; sternum length 1.10 mm; sternum width 0.85 mm; sternum index 77.

Femur IV length 1.75 mm; femur IV width 0.50 mm; leg thickness index 27; leg length index 76.

Abdomen length 2.65 mm; abdomen width 1.40 mm; abdomen index 53.

Embolus length 0.11 mm; bulb length 0.77 mm; male genital index 14.

Description. Carapace dark red-brown, with some short light hairs, longer hairs on head region. Head region narrows (cephalic width index 54) and is smoothly truncated anteriorly. Eyes moderate and equal. Thoracic groove moderate.

Abdomen long oval widening posteriorly, with a full, red-brown dorsal sclerite partially covered with long plumose white hairs (many rubbed off) in a striped pattern—two anterior white bands, then an

abbreviated band (not reaching lateral sides), and finally a narrow, median, horizontal stripe. Some white hairs at posterior edge of sclerite. Epigastric sclerite light red-brown. Rectangular, light red-brown, ventral sclerite from epigastric furrow to inframammillary sclerite just anterior to posterior spiracular furrow. Anterior abdominal setae very long and fairly thin, posterior pair short and quite stout. Very short abdominal petiole.

Sternum yellow-brown with very few, heavy setae. Pedicel short.

Chelicerae brown, with two moderate retromargin teeth and two promargin teeth, the distal larger and the proximal slightly smaller than the retromargin teeth. No denticle present.

Coxa I light brown-yellow, II light yellow, III and IV yellow. Trochanter IV notch small.

Femur I dark brown lightening to yellow-white at distal end, femur II brown on lateral sides, yellow dorsally and ventrally; rest of legs I and II very light yellow. Femur III yellow with lateral sides light brown, femur IV dark yellow; rest of III yellow, patella-tibia IV yellow, metatarsus IV very light red-brown, and tarsus IV light yellow. Legs moderately hirsute. Tibia I ventral spination: 3–2, moderately small, proximal spines smaller.

Pedipalp with a small tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a straight, thin, and fairly short embolus (Figs. 174, 175).

FEMALE

Measurements. Based on 11 females: carapace length 2.20–2.85 mm; carapace width 1.40–1.85 mm; carapace index 63–67; sternum length 1.05–1.30 mm; sternum width 0.85–1.00 mm; sternum index 77–84.

Femur IV length 1.65–2.10 mm; femur IV width 0.40–0.60 mm; leg thickness index 24–27; leg length index 73–78.

Abdomen length 2.80–3.65 mm; abdomen

width 1.65–2.65 mm; abdomen index 54–76; dorsal sclerite width 0.75–1.20 mm.

Description. Carapace orange, with some short, light hairs, longer on head region. Carapace narrow in head region (cephalic width index 55–61) and smoothly truncated anteriorly. Eyes moderate, equal, and bordered in black. Thoracic groove moderate.

Abdomen oval, with a small, red-brown dorsal sclerite and a black and white hair pattern—two wide horizontal bands of white hair at anterior end (over sclerite), then an abbreviated wide white band, not continuing off lateral sides, followed by a wide, horizontal, median white band, the third and fourth bands joining in median part. Finally, a posterior band of white hairs; rest of the dorsal abdomen covered with black hairs on light grey ground (Fig. 275). Light red-brown epigastric sclerite. Ventral abdomen light grey. A small red-brown inframammillary sclerite. Anterior abdominal setae very thin and long, posterior pair thicker and stouter.

Sternum yellow-brown, with sparse, very long setae. Pedicel fairly short.

Chelicerae light brown, with two moderate retromargin teeth and two promargin teeth, the distal larger and the proximal slightly smaller than the retromargin teeth. No denticle present.

Coxae I, II, and III yellow-white, IV yellow. Trochanter IV notch small.

Femora I dark brown and II brown except yellow-white distal end; rest of legs I and II very light yellow. Femora III and IV deep yellow with dark hairs on sides; rest of leg III dark yellow; patella-tibia IV dark yellow with dark hairs; metatarsus IV red-brown, and tarsus IV light red-brown. Legs moderately hirsute. Tibia I ventral spination: 3–2, moderately small.

External epigynum with very small circular openings near anterior end of spermathecae (Fig. 173). Internal structure with heavily rounded spermathecae with thick posterior necks (Fig. 172).

Diagnosis. The females of *Castianeira athena* have very small epigynal openings (Fig. 173) and a distinctive abdominal hair pattern. The males differ from other *Castianeira* in their small size, embolus, and carapace of a single color.

Remarks. *Castianeira athena* is closely related to *C. rothi* but is somewhat larger and differs in genitalic characters.

Natural history. Nothing is known of the habits of this species. An egg case collected with a female consisted of two disc-like white cases affixed to one another, one case with 27 eggs and the other with 19.

Distribution. Southern California and northwest Mexico (Map 8).

Records. *California.* Inyo Co., Los Angeles Co., Riverside Co., San Bernadino Co., San Diego Co.

MEXICO. *Baja California.*

Castianeira rothi new species

Figures 208–211, 274. Map 8.

Holotype. Male from South Fork of the Cave Creek, Chiricahua Mountains, Cochise Co., Arizona, 18-V-1966 (J. Reiskind); in the Museum of Comparative Zoology. The species is named after Vincent D. Roth.

MALE

Measurements. Based on holotype and 3 males, holotype listed first, range of all follows: carapace length 1.75 mm, 1.60–1.75 mm; carapace width 1.15 mm, 1.10–1.15 mm; carapace index 67, 63–68; sternum length 0.85 mm, 0.75–0.85 mm; sternum width 0.70 mm, 0.65–0.70 mm; sternum index 81, 81–85.

Femur IV length 1.35 mm, 1.25–1.40 mm; femur IV width 0.30 mm, 0.30 mm; leg thickness index 24, 23–26; leg length index 78, 76–81.

Abdomen length 2.10 mm, 2.05–2.15 mm; abdomen width 1.20 mm, 1.05–1.20 mm; abdomen index 57, 52–57.

Embolus length 0.10 mm, 0.08–0.10 mm; bulb length 0.57 mm, 0.54–0.59 mm; male genital index 17, 15–18.

Description. Carapace with orange-brown thoracic region with short, light hairs and a dark brown cephalic region with moderately long, light hair. Head narrows (cephalic width index 53–54) and is smoothly truncated anteriorly. Eyes moderate and equal. Thoracic groove moderately weak.

Abdomen oval, widening posteriorly with a full, punctate, maroon-brown dorsal sclerite with short, plumose hairs—three faint, yellowish, horizontal hair bands, two at anterior end and one at median (Fig. 274). Epigastric sclerite red-brown. A full, rectangular, red-brown ventral sclerite and a small red-brown inframammillary sclerite. First pair of abdominal setae very thin, second pair moderately thin.

Sternum shield-shaped and dark yellow-brown, with sparse, thin setae. Pedicel very short. Abdominal petiole very short but present.

Chelicerae light brown-black, with two moderate retromargin teeth and two promargin teeth, the distal larger and the proximal smaller than the retromargin teeth; with a very small denticle just medial and distal to the larger promargin tooth.

Coxa I light yellow-brown, II and III light yellow, IV yellow. Trochanter IV notch small.

Femur I dark brown, lightening at distal end, femora II–IV yellow with brown lateral sides. Rest of legs I and II light yellow, rest of III dark yellow, patella-tibia IV orange, metatarsus IV dark red-brown, tarsus IV light yellow-brown. Tibia I ventral spination: 2–1, small. Legs lightly hirsute.

Pedipalp with a blunt, short tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with straight, moderately sclerotized embolus with a distinct twist at the tip (Fig. 210, 211).

FEMALE

Measurements. Based on 10 females: carapace length 2.15–2.50 mm; carapace

width 1.40–1.60 mm; carapace index 65–68; sternum length 1.00–1.10 mm; sternum width 0.85–0.95 mm; sternum index 80–85.

Femur IV length 1.60–1.85 mm; femur IV width 0.40–0.50 mm; leg thickness index 24–27; leg length index 74–79.

Abdomen length 2.60–3.50 mm; abdomen width 1.60–2.75 mm; abdomen index 60–78; dorsal sclerite length 1.00–1.10 mm; dorsal sclerite width 0.95–1.20 mm; dorsal sclerite index 83–109.

Description. Carapace with red-brown thoracic region with short, light hairs and a dark red-brown cephalic region with moderately long, light hairs. Head narrow (cephalic width index 55–64) and smoothly truncated anteriorly. Eyes moderate and equal. Thoracic groove moderately weak.

Abdomen a wide oval and brown, with a moderately small maroon sclerite. A faint, light, horizontal band just anterior to median of abdomen. Epigastric sclerite red-brown. Ventrums with two faint beaded stripes from sides of epigastric furrow to spinnerets. First pair of abdominal setae very thin, second pair moderately thin.

Sternum shield-shaped, orange, with sparse, thin setae. Pedicel very short.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; with a very small denticle just medial and distal to the larger promargin tooth.

Coxa I yellow-brown, II, III, and IV deep yellow. Trochanter IV notch small.

Femur I dark brown, lighter at distal end, femora II–IV yellow with brown lateral sides. Rest of legs I and II light yellow, of leg III yellow, patella-tibia IV yellow-brown, metatarsus IV red-brown, tarsus IV yellow. Tibia I ventral spination: 3–2, moderate. Legs lightly hirsute.

External epigynum with widely separated circular openings (Fig. 209). Internal structure with rounded saclike spermathecae having thick posterior necks (Fig. 208).

Diagnosis. *Castianeira rothi* differs from



other members of the *athena* group in its genitalic characters and in having its cephalic region darker than the thoracic region.

Remarks. This species is closely related to *C. athena* but is smaller and has distinctive genitalia (females) and color and hair patterns.

Natural history. *C. rothi* is found in the mountainous oak forests of southern Arizona.

Distribution. Southern Arizona (Map 8).

Records. Arizona. Cochise Co., Santa Cruz Co.

THE *DORSATA* GROUP

Characteristics. Large (male carapace length 2.85–4.60 mm; female carapace length 2.85–5.40 mm), with a carapace index 65–69. Abdomen covered with black and white, and yellow or orange plumose hairs. Epigynum with a pair of fairly high openings, with the bursae copulatrices

more or less passing over the globose anterior of the spermathecae. Male genital index 22–38. Eyes moderately small and approximately equal (anterior median eyes sometimes slightly larger than laterals).

Discussion. This Mexican and Central American group is easily distinguished by the genitalia—very long emboli and distinctive bursae copulatrices.

Castianeira dorsata (Banks)

Figures 133–136, 148. Map 9.

Thargalia dorsata Banks, 1898, Proc. California Acad. Sci. (3)1(7):228, pl. 13, fig. 30, ♀, ♂. Male and female cotypes from San José del Cabo, Sierra San Nicolas, and Sierra San Lazaro in Baja California, Mexico; in the California Academy of Sciences; destroyed, and the Museum of Comparative Zoology; examined. Male lectotype from Sierra San Lazaro chosen.

MALE

Measurements. Based on lectotype and 6 males, lectotype listed first, range of all follows: carapace length 3.95 mm, 3.10–

4.60 mm; carapace width 2.60 mm, 2.00–2.95 mm; carapace index 66, 65–69; sternum length 1.75 mm, 1.40–2.05 mm; sternum width 1.40 mm, 1.10–1.55 mm; sternum index 80, 78–83.

Femur IV length 2.85 mm, 2.55–3.70 mm; femur IV width 0.85 mm, 0.65–0.95 mm; leg thickness index 30, 25–30; leg length index 72, 72–83.

Abdomen length 4.10 mm, 3.35–5.10 mm; abdomen width 2.15 mm, 1.55–2.40 mm; abdomen index 53, 46–53.

Embolus length 0.26 mm, 0.26–0.29 mm; bulb length 1.20 mm, 1.10–1.28 mm; male genital index 22, 22–25.

Description. Carapace red-brown with a wide longitudinal median stripe of white hairs and a lighter pigmented spot just anterior to the thoracic groove. Head narrow (cephalic width index 53–60) and smoothly truncated anteriorly. Eyes moderate and equal. Thoracic groove moderate.

Abdomen a long oval with a full dorsal sclerite, orange medially, orange-brown on sides, and covered with fairly long white hairs. Epigastric sclerite maroon over book-lungs but orange at center. An almost full, rectangular, orange ventral sclerite and a small orange-brown inframammillary sclerite. First pair of abdominal setae hair-like, second pair very thin.

Sternum shield-shaped and orange, with sparse, thin setae. Pedicel very short.

Chelicerae red-brown with two moderate retromargin teeth and two promargin teeth, the distal one much larger and the proximal one smaller than the retromargin teeth. No denticle present.

Coxae all orange-brown. Trochanter IV notch moderately small.

Femora all red-brown. Rest of legs I and II yellow-orange; rest of legs III and IV orange except tarsi yellow. Tibia I ventral spination: 3–2, moderate. Legs heavily hirsute.

Pedipalp with a short, sharp tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with a long,

straight, thin, sclerotized embolus with a distinct twist at the tip (Figs. 134, 135).

FEMALE

Measurements. Based on 5 females: carapace length 3.95–4.55 mm; carapace width 2.60–2.95 mm; carapace index 65–68; sternum length 1.65–1.95 mm; sternum width 1.40–1.55 mm; sternum index 79–83.

Femur IV length 2.95–3.30 mm; femur IV width 0.85–0.95 mm; leg thickness index 28–29; leg length index 72–80.

Abdomen length 4.20–5.60 mm; abdomen width 2.40–4.15 mm; abdomen index 58–77; dorsal sclerite length 0.55–0.95 mm; dorsal sclerite width 1.10–1.50 mm; dorsal sclerite index 153–206.

Description. Carapace deep red-brown with a wide longitudinal median stripe of white hair. Head narrow (cephalic width index 60–63) and smoothly truncated anteriorly. Eyes moderate and equal. Thoracic groove moderately strong.

Abdomen oval, with a small red-brown dorsal sclerite (white hairs on the sclerite) and a wide longitudinal band of orange hair with brownish hairs on the sides (Fig. 148). Epigastric and small inframammillary sclerites red-brown. Ventrums with two beaded stripes from sides of epigastric furrow to the posterior sclerite. First pair of abdominal setae very thin, second pair thin.

Sternum shield-shaped and red-brown, with sparse, thin setae. Pedicel very short.

Chelicerae deep red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one much larger and the proximal one smaller than the retromargin teeth. No denticle present.

Coxae all red-brown. Trochanter IV notch moderately small.

Legs all red-brown, with legs I and II distal to the femora and all tarsi slightly lighter. Tibia I ventral spination: 3–2, moderately strong. Legs heavily hirsute.

External epigynum with two small, widely separated, round openings (Fig.

136), internal structure with rounded spermathecae and short posterior necks, the bursae copulatrices close to the spermathecae (Fig. 133).

Diagnosis. *Castianeira dorsata* differs from other *dorsata* group species in having small, medially directed epigynal openings (in the female) and an abdomen without any yellow or white spots (in the male).

Remarks. The red-orange hair band on the abdomen is often broken horizontally in several places, especially near the posterior end, and also often extends down the sides. The distinctive female genitalia distinguishes this species from others that look superficially like it—*Castianeira ornata* (in the *longipalpus* group) and *C. occidens* (in the *descripta* group). The convergent pattern of a red-orange abdomen and often a longitudinal band of white hairs on the carapace may be the result of selection for mutillid wasp mimicry, but there are no field observations either to support or to refute this, except those of Scheffer (1906) (see *Natural history*, under *Castianeira descripta*).

Natural history. Nothing is known of the habits of this species.

Distribution. Southwestern U.S. and northwestern Mexico (Map 9).

Records. Arizona. Cochise Co., Yuma Co. MEXICO. Baja California., Jalisco., Michoacan., Morelos., Nayarit., Nuevo Leon., Sinaloa., Sonora.

Castianeira stylifera Kraus

Figures 145–147, 159. Map 9.

Castianeira stylifera Kraus, 1955, Abhandl. Senckenb. Naturf. Ges. 493:49–50, figs. 128–130, ♂, ♀. Male holotype from Finca La Yoya, Sonsonate, El Salvador; in the Senckenberg Museum, examined.

MALE

Measurements. Based on one male holotype: carapace length 4.55 mm; carapace width 2.95 mm; carapace index 65; sternum length 2.05 mm; sternum width 1.55 mm; sternum index 75.

Femur IV length 3.55 mm; femur IV width 0.95 mm; leg thickness index 27; leg length index 78.

Abdomen length 5.10 mm; abdomen width 2.20 mm; abdomen index 43.

Embolus length 0.39 mm; bulb length 1.61 mm; male genital index 24.

Description. Carapace dark red-brown, with short, sparse white hairs except “head” lighter red-brown and covered with longer white hair. Lateral edges of carapace bordered in heavy white hair except in head region. Eyes equal and bordered in black. Head narrow (cephalic width index 59) and smoothly truncated anteriorly.

Abdomen very long and oval, with a full dorsal sclerite, red-brown except for a large central spot and a posterior spot of dark yellow, and covered with plumose white hairs. Epigastric sclerite light red-brown. A rectangular red-brown ventral sclerite from epigastric furrow to an inframamillary sclerite. Abdominal setae very thin. Pedicel very short.

Sternum light red-brown, with very long, thin setae.

Chelicerae light red-brown, with two moderate retromargin teeth and two promargin—the distal one larger and the proximal one smaller than the retromargins. A denticle possibly present.

Coxae all yellow-brown. Trochanter IV notch moderate.

Femora I and II brown, patellae I and II yellow-brown, rest of I and II light yellow. Leg III dark yellow-brown, with a darker brown ring in center of tibia and lighter tarsus. Femur IV brown, rest of IV dark yellowish brown, with a dark brown, wide ring in the center of tibia and lighter tarsus. Legs heavily hirsute, with patches of white hairs on femora, and moderately heavily spiny. Tibia I ventral spination: 3–2.

Pedipalp with a moderate tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a long, heavily sclerotized embolus tip (Fig. 147).

FEMALE

Measurements. Based on 2 females: carapace length 4.55–5.40 mm; carapace width 2.95–3.65 mm; carapace index 65–67; sternum length 2.00–2.30 mm; sternum width 1.60–1.75 mm; sternum index 77–79.

Femur IV index 3.30–3.85 mm; femur IV width 1.00–1.20 mm; leg thickness index 30–31; leg length index 72–73.

Based on one female only: abdomen length 6.90 mm; abdomen width 4.40 mm; abdomen index 64.

Description. Carapace dark purplish red-brown covered with light hairs, especially long and dense on cephalic region, and lateral edges of thoracic region bordered with heavy white hair. Head narrow (cephalic width index 62) and smoothly truncated anteriorly. Eyes almost equal, with darker borders.

Abdomen oval, with small, red-brown, anterior dorsal sclerite, and covered with light yellow and black plumose hairs; anterior end black with some white hairs, then a wide horizontal light band continuing posteriorly along median to another wide band, thereby providing two large dark lateral spots, and a wide black posterior end (Fig. 159). Epigastric sclerite red-brown. Ventral abdomen with two faint, longitudinal, beaded stripes from sides of epigastric furrow posteriorly. Anterior abdominal setae hairlike, posterior pair very thin. Pedicel short.

Sternum dark red-brown, with long, fairly thin setae.

Chelicerae dark red-brown, with two medium retromargin teeth and two promargin teeth, the distal one larger and the proximal smaller than the retromargins. A denticle possibly present.

Coxae all red-brown. Trochanter IV notch moderate.

All femora dark red-brown; patellae I and II light red-brown, rest of legs I and II yellow. Rest of legs III and IV dark red-brown with lighter tarsi. Legs moderately

hirsute, with white hair patches on femora and legs III and IV, and moderately heavy spination. Tibia I ventral spination: 3–2.

External epigynum with small semicircular openings (Fig. 146). Internal structure highly sclerotized, with saclike spermathecae and with bursae copulatrices passing over anterior end of spermathecae (Fig. 145).

Diagnosis. The males of *Castianeira stylifera* differ from those of other *dorsata* group species in their genitalia (male genital index 24) and light abdominal spots. The females differ from the others in their epigynal openings (smaller than those of *C. azteca*) and abdominal pattern (which is similar to *C. azteca*).

Remarks. This species is closely related to *Castianeira azteca* but is much larger and has distinct genitalia. The yellow (much redder in the living spider) abdominal spots may be of mimetic (to mutillid wasps) value.

Natural history. Nothing is known of the habits of this species.

Distribution. El Salvador (Map 9).

Castianeira azteca new species

Figures 137–141, 156. Map 9.

Holotype. Male from La Planta de Moctezuma, near Fortin, Veracruz, Mexico, 7-VII-1947 (C. and M. Goodnight); in the American Museum of Natural History. The specific name is an adjective from the name given to Indians of the Nahuatlán tribe which founded the pre-Columbian Mexican Empire.

MALE

Measurements. Based on holotype and 5 males, holotype listed first, range of all follows: carapace length 3.90 mm, 2.85–4.25 mm; carapace width 2.60 mm, 1.90–2.80 mm; carapace index 67, 65–69; sternum length 1.75 mm, 1.30–1.90 mm; sternum width 1.35 mm, 1.05–1.40 mm; sternum index 76, 74–80.

Femur IV length 2.95 mm, 2.40–3.20

mm; femur IV width 0.90 mm, 0.60–0.95 mm; leg thickness index 30, 25–30; leg length index 76, 75–83.

Abdomen length 4.55 mm, 3.40–4.75 mm; abdomen width 1.95 mm, 1.50–2.40 mm; abdomen index 43, 43–53.

Embolus length 0.47 mm, 0.42–0.52 mm; bulb length 1.44 mm, 1.16–1.56 mm; male genital index 33, 32–38.

Description. Carapace maroon, granulose, and covered with white plumose hairs in a wide longitudinal band over the thoracic region and widening to cover the cephalic region with longer hairs. Head narrows (cephalic width index 53–55) and is smoothly truncated anteriorly. Eyes moderately small and equal. (Anterior medians slightly larger than laterals.) Thoracic groove strong.

Abdomen a long oval, with a full, dark red-brown dorsal sclerite (with two lighter spots, one in middle and one at posterior) covered with a very wide longitudinal band of heavy white hairs. Epigastric sclerite and small inframammillary sclerite dark red-brown, three-quarters rectangular ventral sclerite red-brown with some white hairs. Both pairs of abdominal setae thin.

Sternum shield-shaped and red-brown, with sparse, long, thin setae. Pedicel very short.

Chelicerae dark red-brown, with two moderately large retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a very minute denticle just median and distal to the larger promargin tooth.

Coxae all dark orange-brown. Trochanter IV notch moderately strong.

Femora all dark red-brown, with abundant white hair. Rest of legs I and II yellow-orange; rest of legs III and IV dark red-brown (III slightly lighter), with yellow-orange tarsi. Legs heavily hirsute. Tibia I ventral spination: 3–2, moderately long and strong.

Pedipalp with a short, fairly blunt, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a very long and slightly curved sclerotized embolus (Fig. 139–141).

FEMALE

Measurements. Based on 2 females: carapace length 3.50–4.60 mm; carapace width 2.35–2.95 mm; carapace index 65–68; sternum length 1.55–1.95 mm; sternum width 1.25–1.55 mm; sternum index 79–81.

Femur IV length 2.70–3.15 mm; femur IV width 0.75–1.05 mm; leg thickness index 29–33; leg length index 69–78.

Abdomen length 3.85–4.45 mm; abdomen width 2.30–2.65 mm; abdomen index 59–60; dorsal sclerite length 0.40–0.85 mm; dorsal sclerite width 1.05–1.65 mm; dorsal sclerite index 190–250.

Description. Carapace orange, granulose, and covered with black and white plumose hairs in a wide longitudinal band over the thoracic region, widening to cover the cephalic region with longer hairs. Head narrows (cephalic width index 58–59) and is smoothly truncated anteriorly. Eyes moderately small, equal, and bordered in black. Thoracic groove moderately strong.

Abdomen a large oval with a small, red-brown dorsal sclerite and a black and orange hair pattern with some white hairs on the sclerite—wide longitudinal orange hair band from sclerite to area just anterior to spinnerets and extending somewhat laterally at middle and at posterior end (Fig. 156), abundant white hair spots on sides of abdomen. Epigastric sclerite light orange. Ventrum with a pair of light lines from sides of epigastric furrow to a small, orange-brown, inframammillary sclerite. First pair of abdominal setae very thin, second pair thin.

Sternum shield-shaped, orange, with long, thin setae.

Chelicerae orange-brown, with two moderately large retromargin teeth and two

promargin teeth, the distal one larger and the proximal one smaller than the retro-margin teeth; a very small denticle just median and distal to the larger promargin tooth.

Coxae all light yellow-orange. Trochanter IV notch moderate.

All femora light orange; rest of legs I and II light yellow; rest of legs III and IV light orange, but with center half of tibia IV and all of metatarsus IV light orange-brown. Legs moderately heavily hirsute. Tibia I ventral spination: 2-2, moderate length and heavy.

External epigynum with two semicircular, slitlike openings directed posteriorly and slightly medially (Fig. 138). Internal structure with rounded spermathecae having thick posterior necks and bursae copulatrices looping over anterior ends of spermathecae (Fig. 137).

Diagnosis. *Castianeira azteca* closely resembles *C. stylifera* but differs from it in male genitalia (male genital index 32-38), in female genitalia (epigynal openings larger than in *C. stylifera*), and in size (*C. azteca* smaller than *C. stylifera*).

Remarks. There is considerable variation in this species. Males from Veracruz and Oaxaca have shorter emboli (male genital index 32-33) than do those from Guerrero (male genital index 35-38), and the abdominal spots vary in length and width in the two females. These spiders may be mutillid wasp mimics.

Natural history. Nothing is known of the habits of this species.

Distribution. Mexico (Map 9).

Records. MEXICO. *Nayarit.*, *Oaxaca.*, *Veracruz.*

Castianeira luctuosa O. P.-Cambridge

Figures 142, 152. Map 9.

Castianeira luctuosa O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:287, pl. 32, fig. 9, ♀, from Amula, Guerrero, Mexico; in the British Museum (Natural History), examined.

FEMALE

Measurements. Based on one female holotype: carapace length 2.85 mm; carapace width 1.85 mm; carapace index 66; sternum length 1.30 mm; sternum width 1.05 mm; sternum index 81.

Femur IV length 2.35 mm; femur IV width 0.60 mm; leg thickness index 25; leg length index 83.

Abdomen length 3.10 mm; abdomen width 2.00 mm; abdomen index 64; dorsal sclerite length 1.40 mm; dorsal sclerite width 1.20 mm; dorsal sclerite index 86.

Description. Carapace dark red-brown, slightly lighter red-brown in head region, uniformly covered with moderately dense white hair. Carapace moderately narrow in head region (cephalic width index 65) and smoothly truncated anteriorly. Eyes bordered in black, and posterior eyes equal, whereas anterior median eyes moderately larger than anterior lateral eyes. Thoracic groove relatively weak.

Abdomen oval, with a large, orange-brown dorsal sclerite (about two-fifths of the way from anterior end) and a light brown and white dorsal hair pattern—two horizontal anterior white bands, a short median sinuous horizontal white bar, a median white band, two pairs of small horizontal white spots, and a posterior white hair band (Fig. 152). Ventral abdomen yellow with two faint longitudinal lines. On each side of abdomen two large white hair spots—one below mid-band and one below anterior sclerite. Anterior abdominal setae thin, posterior pair moderately thin (fairly thick at base).

Sternum light brown, with thin setae. Pedicel negligible.

Chelicerae light brown, with two moderate retromargin teeth and two promargin teeth, the distal one slightly longer and the proximal one slightly smaller than the retromargin teeth.

Coxae all yellow-brown. Trochanter IV notch moderate.

Femora light brown; rest of legs I and II light yellow; rest of leg III yellow, with metatarsus darker; rest of leg IV light brown, with ends of tibia much lighter and tarsus yellow. Legs moderately hirsute.

External epigynum with moderately small, anteriorly and laterally oriented, slitlike openings (Fig. 142). Internal structure with typical inverted pear-shaped spermathecae.

Diagnosis. The epigynal openings (moderately small and directed anteriorly and laterally) and abdominal white hair pattern distinguish this species from all other *Castianeira*.

Natural history. Nothing is known of the habits of this species.

Distribution. Only known from the type locality in Guerrero, Mexico (Map 9).

Records. MEXICO. Guerrero.

THE TRUNCATA GROUP

Castianeira truncata Kraus

Figures 205, 206. Map 10.

Castianeira truncata Kraus, 1955, Abhandl. Senckenb. Naturf. Ges. 493:48–49, figs. 126–127, ♂, from Finca El Carmen, San Vicente, El Salvador; in the Senckenberg Museum, examined.

MALE

Measurements. Based on one male holotype: carapace length 2.05 mm; carapace width 1.35 mm; carapace index 67; sternum length 0.95 mm; sternum width 0.80 mm; sternum index 85.

Femur IV length 1.60 mm; femur IV width 0.45 mm; leg thickness index 29; leg length index 78.

Abdomen length 2.65 mm; abdomen width 1.35 mm; abdomen index 51.

Embolus length 0.09 mm; bulb length 0.63 mm; male genital index 14.

Description. Carapace dark red-brown, with short white hairs over total surface. Head region narrow (cephalic width index 54) and smoothly truncated anteriorly.

Posterior eyes equal, anterior median eyes somewhat larger than anterior lateral eyes, and all eyes bordered in black. Thoracic groove fairly weak.

Abdomen long, oval, widening posteriorly, with a full, maroon dorsal sclerite covered with white hairs (many rubbed off). Epigastric sclerite dark red-brown. Wide, rectangular, dark red-brown ventral sclerite from epigastric furrow to a small inframammillary red-brown sclerite. Anterior abdominal setae very thin and long, posterior pair much shorter, stouter, and close to abdomen. Abdominal petiole short but distinct.

Sternum red-brown, with sparse, light, hairlike setae. Pedicel short.

Chelicerae red-brown, with two fairly small retromargin teeth and two promargin teeth, the distal one larger and the proximal one a bit smaller than the retromargin teeth. A denticle probably present.

Coxa I very light brown, coxae II and III yellow, and coxa IV yellow-brown. Trochanter IV notch small.

Femora I and II brown at base, grading to light yellow at distal end and on dorsal side; rest of legs I and II light yellow. Femur, patella-tibia, and metatarsus III dark brown on lateral sides and yellow-brown on dorsum and ventrum, tarsus III light yellow. Femur IV dark brown with light distal end, patella-tibia dark brown with a very light distal end, metatarsus IV dark brown, tarsus IV yellow-brown. Legs moderately hirsute. Tibia I ventral spination: 2–1.

Pedipalp with a small tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck and ending with a lightly sclerotized, blunt-ended embolus (Figs. 205, 206).

Diagnosis. The short, clublike embolus (Fig. 206) and the small size of *C. truncata* distinguish it from all other *Castianeira*.

Natural history. Nothing is known of the habits of this species.

Distribution. El Salvador (Map 10).

THE *DUBIA* GROUP

Characteristics. Moderately large (male carapace length 2.15–2.95 mm; female carapace length 2.95–3.90 mm), with a carapace index 54–60 (fairly narrow). Abdomen elongate, especially in the male (male abdomen index 30–38). Spermathecae with globose anterior ends and moderately thin posterior necks. Eyes moderately large, with the anterior median eyes much larger than the rest.

Discussion. This group and the three single species groups following it are large *Castianeira*, with anterior median eyes much larger than the laterals. This eye character is common in larger neotropical *Castianeira* and is one of the major characters used in the original description of the genus (Keyserling, 1879).

Castianeira dubia (O. P.-Cambridge), new combination. Figures 168–171, 182, 183. Map 10.

Corinnomma dubium O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:277, pl. 34, fig. 1, ♀, from Teapa, Tabasco, Mexico; in the British Museum (Natural History), examined. *Myrmecotypus dubius*: F. P.-Cambridge, 1899, Biol. Centrali-Americana Arachnida 2:84.

Castianeira nitida Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):6–7, figs. 7, 46, 50, ♂, from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

MALE

Measurements. Based on 10 males: carapace length 2.15–2.95 mm; carapace width 1.30–1.70 mm; carapace index 57–60; sternum length 1.10–1.40 mm; sternum width 0.75–0.95 mm; sternum index 63–70.

Femur IV length 1.65–2.30 mm; femur IV width 0.40–0.50 mm; leg thickness index 23–25; leg length index 65–80.

Abdomen length 3.20–2.90 mm; abdomen width 1.10–1.35 mm; abdomen index 34–38.

Embolus length 0.03 mm; bulb length 0.78–0.98 mm; male genital index 3–4.

Description. Carapace long, red-brown, with fine light hairs and slightly darker on sides. Head narrow (cephalic width index 50–59) and smoothly truncated anteriorly. Eyes somewhat raised, posterior eyes moderate and equal, anterior median eyes larger, and anterior lateral eyes much smaller. Eyes bordered in black. Carapace quite narrow posteriorly. Thoracic groove moderate.

Abdomen elongated, with an almost full, dark red-brown dorsal sclerite and a pattern of white hairs surrounded by golden-brown hairs—a wide anterior horizontal band followed by a pair of spots, then a thin median band and a wide posterior band (Fig. 183). Epigastric and a large ventral sclerite dark red-brown. A small red-brown inframamillary sclerite. First pair of abdominal setae hairlike, second pair moderate.

Sternum shield-shaped, long, and orange-brown, with some fine light hairs. Short pedicel.

Chelicerae orange-brown, with two moderate retromargin teeth and two promargin teeth, the distal larger and the proximal smaller than the promargin teeth; a very small denticle just distal and medial to the larger promargin tooth.

Coxae all light yellow-white. Trochanter IV notch moderately small.

Femora I and II striped—yellow with brown lateral sides; femur III also striped—yellow with light brown sides; femur IV light red-brown. Rest of legs I and II light yellow-white (slightly brown sides); rest of leg III light yellow; rest of leg IV—patella yellow, tibia striped yellow with red-brown sides and yellow distal end. Metatarsus red-brown, tarsus yellow. Legs moderately lightly hirsute. Tibia I ventral spination: 3–2, small.

Pedipalp with a short, blunt tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a very small, conical, sclerotized embolus tip with a distinct twist (Figs. 170, 171).

FEMALE

Measurements. Based on holotype and 10 females, holotype listed first, but not included in range of rest which follows: carapace length 3.20 mm, 3.30–3.90 mm; carapace width 1.75 mm, 1.95–2.30 mm; carapace index 54, 57–59; sternum length 1.45 mm, 1.55–1.80 mm; sternum width 0.95 mm, 1.10–1.20 mm; sternum index 64, 66–72.

Femur IV length 2.20 mm, 2.40–2.95 mm; femur IV width 0.55 mm, 0.60–0.70 mm; leg thickness index 25, 23–26; leg length index 68, 71–77.

Abdomen length 4.65 mm, 3.35–5.55 mm; abdomen width 2.10 mm, 1.75–3.10 mm; abdomen index 45, 52–64; dorsal sclerite length 1.50 mm, 1.30–1.50 mm; dorsal sclerite width 0.85 mm, 0.85–1.05 mm; dorsal sclerite index 59, 62–75.

Description. Carapace long, dark red-brown, with fine light hairs, and cephalic region slightly lighter. Head narrow (cephalic width index 59–65) and smoothly truncated anteriorly. Eyes slightly raised, posterior eyes moderately small and equal, anterior median eyes larger, and anterior lateral eyes much smaller. Eyes bordered in black. Carapace quite narrow posteriorly. Thoracic groove moderately small.

Abdomen elongated oval, with a moderately small, long, red-brown dorsal sclerite and covered with yellow-white and brown hairs. Light hair pattern—cross band over sclerite followed by a short stripe, a thin median stripe, and a wide posterior stripe (Fig. 182). Epigastric sclerite red-brown. A pair of light lines from sides of epigastric furrow to a small, brownish, inframammillary sclerite. First pair of abdominal setae hairlike and very long, second pair moderate and short.

Sternum shield-shaped, long, and dark red-brown, with fine, long hairs. Short pedicel.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin

teeth, the distal larger and the proximal smaller than the promargin teeth; a very small denticle just distal and medial to the larger promargin tooth.

Coxae all light yellow-white (IV slightly darker). Trochanter IV notch moderately small.

Femora I and IV red-brown, lightening at distal end, femora II and III striped—yellow with red-brown sides. Rest of legs I and II—patellae-tibiae yellow-white, metatarsi and tarsi yellow; rest of leg III—patella-tibia striped like femur, metatarsus orange, tarsus yellow; rest of leg IV—patella orange, tibia dark red-brown with distal orange tips, metatarsus dark red-brown, tarsus dark yellow-brown. Legs moderately hirsute. Tibia I ventral spination: 3–2, moderate.

External epigynum with two small openings (Fig. 169). Internal structure with globose spermathecae having fairly narrow posterior necks (Fig. 168).

Diagnosis. Males of *Castianeira dubia* differ from other *Castianeira* in their genitalia (very small conical embolus), abdominal pattern, and abdomen index (34–38). The females have a wide posterior band of yellow-white hairs on the abdomen.

Remarks. The Mexican form (the holotype) has slightly smaller epigynal openings and a narrower posterior stripe. This abdominal pattern may be associated with mutillid wasp mimicry.

Natural history. Nothing is known of the habits of this species.

Distribution. Southern Mexico and Central America (Map 10).

Records. MEXICO. *Tabasco.*

COSTA RICA. Turrialba.

PANAMA. Bocas del Toro, Portobelo.

CANAL ZONE. Barro Colorado Island, Madden Dam Forest.

Castianeira zembla new species

Figures 176, 177, 187. Map 10.

Holotype. Male from Ocosingo, Chiapas, Mexico, 25-VI-1950 (C. and M. Goodnight,

and L. J. Stannard); in the American Museum of Natural History. The specific name is a noun in apposition from the name of a fictitious country in "Pale Fire" by Vladimir Nabokov.

MALE

Measurements. Based on one male holotype: carapace length 2.95 mm; carapace width 1.65 mm; carapace index 56; sternum length 1.55 mm; sternum width 0.95 mm; sternum index 60.

Femur IV length 2.15 mm; femur IV width 0.55 mm; leg thickness index 27; leg length index 71.

Abdomen length 4.10 mm; abdomen width 1.25 mm; abdomen index 30.

Embolus length 0.10 mm; bulb length 0.86 mm; male genital index 11.

Description. Carapace deep, almost black, maroon; slightly lighter in head region, hairless, with a punctate surface. Head narrow (cephalic width index 56) and smoothly truncated anteriorly. Eyes equal and moderate, except anterior median eyes about twice as large as the anterior lateral eyes. Thoracic groove moderately strong.

Abdomen with a full, dark maroon dorsal sclerite, cylindrical, very narrow and long, and pinched very slightly in middle (Fig. 187). Anterior portion with some white hairs, and whole surface punctate. Epigastric sclerite maroon, and elongated rectangular ventral sclerite red-brown (slightly constricted in middle). Small red-brown inframamillary sclerite. First pair of abdominal setae extremely thin, second pair thin. Short but distinct abdominal petiole.

Sternum shield-shaped, fairly long, red-brown, punctate and almost setae-less. Pedicel short.

Chelicerae brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A small distinct denticle medial and distal to larger promargin tooth.

Coxae I and II very light yellow-brown,

III yellow-brown, IV base brown, lightening at distal end. Trochanter IV with a moderate curved notch.

Femora I, III, and IV dark red-brown; II red-brown (darker on sides), lightening at distal tips. Rest of I and II, light yellow patellae and tibiae striped with retrolateral sides of brown; rest of III yellow-brown, with light tarsus; rest of IV reddish-brown, with light tarsus. Tibia I ventral spination: 2-2, moderately small. Legs lightly hirsute.

Pedipalp with a very short tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with a straight, moderately short embolus with a clear twist at the end (Fig. 176, 177).

Diagnosis. *Castianeira zembala* differs from other *dubia* group species in its elongated abdomen (abdomen index 30) and in its genitalia (embolus very distinct from rest of genital bulb).

Remarks. This species is closely related to *C. dubia* and is probably an ant mimic.

Natural history. Nothing is known of the habits of this species.

Distribution. Known only from its type locality in Chiapas, Mexico (Map 10).

Records. MEXICO. Chiapas.

Castianeira rica new species

Figures 162-165, 188, 189. Map 10.

Holotype. Male from Instituto Interamericano Ciencias Agrícolas, Turrialba, Costa Rica, VII/VIII-1965 (J. Reiskind); in the Museum of Comparative Zoology. The specific name is from the Spanish adjective meaning rich.

MALE

Measurements. Based on holotype and 9 males; holotype listed first, range of all follows: carapace length 2.60 mm, 2.40-2.65 mm; carapace width 1.45 mm, 1.40-1.50 mm; carapace index 56, 55-57; sternum length 1.30 mm, 1.20-1.30 mm; sternum width 0.85 mm, 0.80-0.90 mm; sternum index 65, 65-68.

Femur IV length 2.50 mm, 2.30-2.55 mm;

femur IV width 0.45 mm, 0.35–0.45 mm; leg thickness index 18, 15–19; leg length index 95, 88–96.

Abdomen length 3.30 mm, 3.20–3.60 mm; abdomen width 1.10 mm, 1.10–1.30 mm; abdomen index 34, 33–38.

Embolus length 0.10 mm, 0.08–0.11 mm; bulb length 0.82 mm, 0.78–0.85 mm; male genital index 12, 10–14.

Description. Carapace orange, with some short, dark hairs on thoracic region and longer white hairs on cephalic region. Head narrow (cephalic width index 55–57) and smoothly truncated anteriorly. Eyes moderate, equal (except anterior lateral eyes smaller than the rest), and bordered in brown-black. Thoracic groove moderate.

Abdomen an elongate cylinder moderately constricted in middle, with a full dorsal sclerite, red-brown at anterior with yellow hairs, bright orange at constriction with whitish hairs, followed by a band of dark hair, and the posterior third with yellow hair on orange-brown sclerite base (Fig. 188). Dark reddish brown epigastric sclerite, long ventral sclerite from red-brown (anterior) to yellow-orange (posterior). Very small orange-brown inframamillary sclerite. First pair of abdominal setae very thin and very long, second pair very thin but only moderately long.

Sternum shield-shaped and yellow, with a few long, thin setae.

Chelicerae dark yellow, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; with a very small denticle just medial and distal to the larger promargin tooth.

Coxae I–III white, coxa IV light yellow. Trochanter IV notch moderately small.

Femora I and II yellow, III yellow-orange, all with lateral sides slightly darker. All tarsi cream colored. Rest of I and II very light yellow; rest of III yellow-orange; all of IV orange-brown. Tibia I ventral spination: 3–2, thin (proximal prolateral

spine smaller than rest). Legs lightly hirsute.

Pedipalp with a blunt, short, tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with a straight moderately short embolus with a distinct twist at the tip (Figs. 164, 165).

FEMALE

Measurements. Based on 10 females: carapace length 2.95–3.30 mm; carapace width 1.65–1.90 mm; carapace index 57–59; sternum length 1.40–1.60 mm; sternum width 0.95–1.10 mm; sternum index 68–73.

Femur IV length 2.20–2.40 mm; femur IV width 0.50–0.55 mm; leg thickness index 22–23; leg length index 72–76.

Abdomen length 2.85–3.85 mm; abdomen width 1.40–2.35 mm; abdomen index 46–64; dorsal sclerite length 1.30–1.50 mm; dorsal sclerite width 0.95–1.15 mm; dorsal sclerite index 68–77.

Description. Carapace red-brown (slightly lighter in cephalic region), with sparse, short, white hairs, longer on cephalic region. Head narrow (cephalic width index 57–59) and smoothly truncated anteriorly. Eyes moderately large and all equal, except the anterior lateral eyes almost half the size of the other eyes. Thoracic groove moderate.

Abdomen a wide oval, with a moderately large, red-brown, anterior dorsal sclerite and faint light horizontal hair stripes—two wide bands over the sclerite followed by a pair of spots and a thin median band. The brownish black abdomen with some horizontal light pigmentation bands on posterior half (Fig. 189). Dark red-brown epigastric sclerite and small red-brown inframamillary sclerite. Ventrums with a longitudinal white bar and two horizontal oval white spots on each side just above mid-line. Both pairs of abdominal setae very thin and long.

Sternum shield-shaped, yellow-orange, with very sparse, thin setae.

Chelicerae orange-brown, with two mod-

erate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; with a very small denticle just medial and distal to the larger promargin tooth.

Coxa I brownish white, II and III cream white, IV yellow-brown. Trochanter IV notch fairly small.

Femur I dark brown, femur II deep yellow with brown lateral sides, femora III and IV orange-brown, darker on lateral sides. Patella-tibia I yellow-white, rest of I yellow-brown; patella-tibia II light yellow, rest of II deep yellow; rest of III deep yellow-orange; patella-tibia IV from light red-brown proximally to red-brown distally, metatarsus IV light red-brown, tarsus IV light yellow-brown. Tibia I ventral spination: 3-2, with moderately long and thin spines. Legs moderately hirsute.

External epigynum with widely separated, moderately large circular openings (Fig. 162). Internal structure with globose spermathecae narrowing to fairly thin posterior necks (Fig. 161).

Diagnosis. Males of *Castianeira rica* differ from other *dubia* group species in their bright orange color. The females have a distinct abdominal pattern.

Remarks. *Castianeira rica* is an ant-mimicking spider exhibiting strong sexual dimorphism.

Natural history. This species is found on dead leaves in shady areas. It walks with an ant-like gait; the first pair of legs is raised, giving an illusion of antennae. The reddish male appears to mimic reddish ectatommine or attine ants, whereas the darker female mimics darker and slightly larger ponerines.

C. rica makes a slightly oval, dislike, white egg case on the underside of dead leaves. Of seven egg cases studied, one had seven eggs, two had eight eggs, two had nine eggs, and one had ten eggs (an average of 8.6 eggs per case).

Distribution. Southern Mexico to Costa Rica (Map 10).

Records. MEXICO. Chiapas.
COSTA RICA. Turrialba.

THE ALBA GROUP

Castianeira alba new species

Figures 143, 144, 157, 158, 160, 161.
Map 10.

Holotype. Female from the Instituto Interamericana Ciencias Agricolas, Turrialba, Costa Rica, VII/VIII-1965 (J. Reiskind); in the Museum of Comparative Zoology. The specific name is an adjective meaning white.

MALE

Measurements. Based on 8 males: carapace length 2.75-3.25 mm; carapace width 1.95-2.25 mm; carapace index 69-72; sternum length 1.25-1.45 mm; sternum width 1.05-1.25 mm; sternum index 81-88.

Femur IV length 2.20-2.55 mm; femur IV width 0.65-0.75 mm; leg thickness index 29-31; leg length index 78-81.

Abdomen length 3.15-3.70 mm; abdomen width 1.70-1.95 mm; abdomen index 52-58.

Embolus length 0.16-0.21 mm; bulb length 0.98-1.16 mm; male genital index 16-18.

Description. Carapace maroon-brown, with short white hairs in a wide longitudinal band, with two wide lateral bands (hairs longer in cephalic region), and between the bands two longitudinal bands of black hair. Head narrow (cephalic width index 47-50) and smoothly truncated anteriorly. Eyes moderate and all about equal, except anterior lateral eyes smaller than the rest. Thoracic groove moderately strong.

Abdomen a long oval, with a full, dark maroon, dorsal sclerite covered with black and white hairs—white hair pattern with two wide horizontal white hair bands at anterior end followed by two white spots, then a medial white hair band split medially and attached to the preceding spots, then followed by a pair of small spots and

three narrow horizontal bands (Fig. 157). Epigastric, full ventral and moderate inframammillary sclerites maroon with dark hairs. First pair of abdominal setae very thin and long, second pair moderately thin and shorter.

Sternum red-brown with very sparse, thin setae.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a very small denticle just medial and distal to the larger promargin tooth.

Coxae light orange-brown (hind ones darker). Trochanter IV notch moderate.

Femora I and II orange-brown, III and IV dark red-brown. Rest of legs I and II from yellow-orange proximally to light yellow distally; rest of leg III from red-brown to yellow; rest of leg IV dark maroon-brown patella-tibia and metatarsus and yellow-brown tarsus. Legs heavily hirsute with abundant black and white hairs on femora and white hairs at both ends of tibia IV. Tibia I ventral spination: 3-2, moderately thick and short.

Pedipalp with a blunt, almost negligible, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a stout, straight embolus and a terminal twist (Figs. 143, 144).

FEMALE

Measurements. Based on holotype and 5 females, holotype listed first, range of all follows: carapace length 3.70 mm, 3.25-3.75 mm; carapace width 2.55 mm, 2.45-2.75 mm; carapace index 69, 69-75; sternum length 1.65 mm, 1.60-1.75 mm; sternum width 1.35 mm, 1.30-1.40 mm; sternum index 82, 80-82.

Femur IV length 2.65 mm, 2.50-2.80 mm; femur IV width 0.80 mm, 0.75-0.90 mm; leg thickness index 30, 30-32; leg length index 72, 72-76.

Abdomen length 4.20 mm, 4.20-4.40 mm; abdomen width 2.65 mm, 2.65-2.75 mm;

abdomen index 63, 62-63; dorsal sclerite length 1.30 mm, 1.15-1.40 mm; dorsal sclerite width 1.00 mm, 0.95-1.10 mm; dorsal sclerite index 76, 76-83.

Description. Carapace dark maroon-brown, with short white hairs in a wide longitudinal band, with two wide lateral bands (hairs longer in cephalic region), and between these bands two longitudinal bands of black hair. Head narrow (cephalic width index 52-57) and smoothly truncated anteriorly. Eyes moderate and all about equal, except anterior lateral eyes much smaller than the rest. Thoracic groove moderately strong.

Abdomen a wide oval, with a moderately small, maroon dorsal sclerite and covered with black and white hairs—two wide horizontal white hair bands at anterior end followed by a pair of white spots, then a white hair band split medially, then finally by a series of about six thin white hair bands (sometimes pairs of spots) (Fig. 158). Epigastric sclerite red-brown. Ventrum with a pair of parallel light stripes down the center, a pair of white hair spots on each side. A small maroon inframammillary sclerite. Both pairs of abdominal setae thin and long.

Sternum shield-shaped, red-brown, with moderately thin, sparse setae.

Chelicerae dark red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; with a very small denticle just medial and distal to the larger promargin tooth.

Coxae all brown. Trochanter IV notch moderate.

Femora all red-brown, hind femora much darker. Rest of legs I and II yellow-brown; rest of leg III fairly dark red-brown, with yellow-brown tarsus; rest of leg IV dark red-brown, with a yellow-brown tarsus. Legs heavily hirsute, with black and white hairs abundant on femora and at both ends of tibia IV. Tibia I ventral spination: 3-2, moderate.

External epigynum with two fairly small, high openings (Fig. 161). Internal structure with globose spermathecae extended with thick necks posteriorly (Fig. 160).

Diagnosis. The anterior median eyes of *Castianeira alba* are larger than the laterals, the carapace is very wide (carapace index 69–75), and the abdominal pattern is distinct, distinguishing it from all other *Castianeira*.

Remarks. This species has the eye arrangement of the *dubia* group, but the female genitalia and body proportions are radically different. The latter characters are probably the result of *C. alba*'s non-mimetic habits.

Natural history. This species is found on dead leaves and sticks in sunlit areas. Usually it rests under the edge of a leaf; it runs, never walks, from under one leaf to under another. Sometimes this spider suns itself for up to about 30 seconds, pumping its abdomen up and down in the same manner as *Castianeira variata*.

C. alba makes an almost round, white, dislike egg sac on the undersides of dry, dead leaves. Of four egg sacs studied, one had 12 eggs, one had 17, and two had 14 (an average of 16.3 eggs per case).

Distribution. Costa Rica to Panama (Map 10).

Records. COSTA RICA. Turrialba.

PANAMA. Boquete.

CANAL ZONE. Barro Colorado Island, Chilibre, Fort Sherman, France Field, Summit.

THE *SIMILIS* GROUP

Castianeira similis (Banks), new combination

Figures 166, 167, 184–186. Map 11.

Myrmecotypus similis Banks, 1929, Bull. Mus. Comp. Zool. 69:61, fig. 70, "♀." Penultimate female holotype from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined.

FEMALE

Measurements. Based on 2 females: carapace length 4.15–5.10 mm; carapace

width 2.30–2.75 mm; carapace index 54–56; sternum length 1.95–2.35 mm; sternum width 1.15–1.45 mm; sternum index 59–62.

Femur IV length 3.05–3.75 mm; femur IV width 0.65–0.70 mm; leg thickness index 19–21; leg length index 74.

Abdomen length 5.45–6.10 mm; abdomen width 2.05–2.45 mm; abdomen index 37–40; dorsal sclerite length 1.70–2.10 mm; dorsal sclerite width 1.10–1.30 mm; dorsal sclerite index 63–66.

Description. Carapace deep maroon-black, punctate, surface with long white hairs on head region. Head region distinguished from the thorax region by a slight impression reinforced with black hairs. Head narrows (cephalic width index 65–67) and is distinctly truncated anteriorly (Fig. 186). Eyes equal, except anterior median eyes almost twice as large as anterior lateral eyes. Thoracic groove strong.

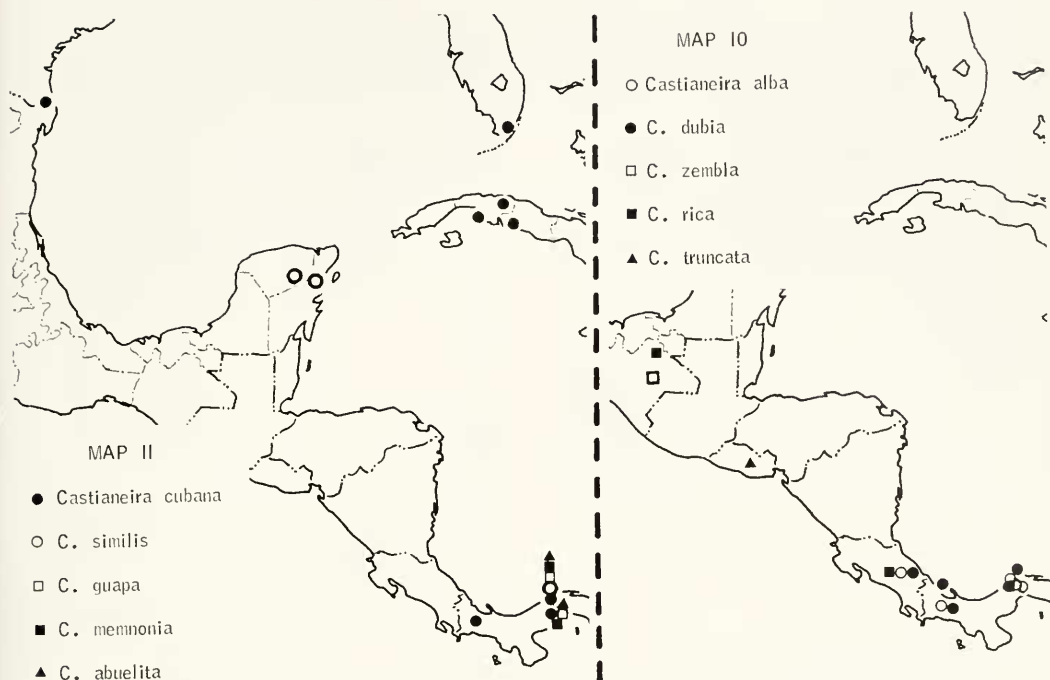
Abdomen elongated and ponerine-like, with a fairly small, red-brown, dorsal sclerite and a slight median constriction (Figs. 184, 185). Several horizontal bands of blackish hairs and many very long, thin setae. Epigastric sclerite red-brown. Ventrums with a lighter elongated area constricted in middle, with a small, red-brown inframammillary sclerite.

Sternum long, shield-shaped, dark red-brown, and covered with fine setae. Pedicel short.

Chelicerae dark red-brown, with two moderately large retromargin teeth, the distal one slightly larger, and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin; with a small denticle just medial and distal to the larger promargin tooth.

Coxae I–III bright white; coxa IV with basal half red-brown, distal half bright white. Trochanter IV notch small.

Femora I and II, proximal two-thirds red-brown, distal one-third white; femora III and IV red-brown. Rest of I and II with strongly striped patellae and tibiae



(lateral and dorsal stripes of dark brown on white), metatarsus I dark maroon-brown, metatarsus II red-brown, tarsus I yellow, tarsus II yellow-brown; rest of III dark red-brown, except yellow-brown tarsus; rest of IV dark red-brown. Tibia I ventral spination: 3–3, strong and long. Legs lightly hirsute but fairly heavily spiny.

External epigynum with two round openings (Fig. 167). Internal structure with rounded, saclike spermathecae and short, thick posterior necks (Fig. 166).

Diagnosis. This very large species (carapace length 4.15–5.10 mm) has a wide cephalic region, thin legs (leg thickness index 19–21), and long, simple hairs on posterior of abdomen.

Remarks. *Castianeira similis* was described by Banks (1929) from an immature female whose non-genital characters closely match those of two mature females from Yucatan. It is not closely related to *Castianeira salticina* Taczanowski, as Banks (1929) claimed.

The species has a ponerine-like abdomen

(Fig. 184), most dramatic when viewed laterally, the spinnerets placed where the sting is located in a ponerine ant.

Natural history. Nothing is known of the habits of this species, but it is undoubtedly a ponerine ant mimic.

Distribution. Yucatan, Panama, probably Central America (Map 11).

Records. MEXICO. *Quintana Roo, Yucatan.*

CANAL ZONE. Barro Colorado Island.

THE MEMNONIA GROUP

Castianeira memnonia (C. L. Koch)

Figures 178–181, 194–196. Map 11.

Corinna memnonia C. L. Koch, 1842, Die Arachniden 9:20–21, fig. 704, ♀, from Colombia (included Panama before 1903); lost.

Thargalia memnonia: Karsch, 1880, Z. Ges. Naturwiss. 53:376.

Castianeira memnonia: Simon, 1897, Histoire Naturelles des Araignées 2(1):167.

Castianeira memnonia: Banks, 1929, Bull. Mus. Comp. Zool. 69(3):59, pl. 1, fig. 11, pl. 3, fig. 50, pl. 4, fig. 64, ♂, ♀. Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):4, figs. 44, 61, ♂.

MALE

Measurements. Based on 9 males: carapace length 2.50–3.05 mm; carapace width 1.40–1.70 mm; carapace index 55–58; sternum length 1.15–1.40 mm; sternum width 0.75–0.95 mm; sternum index 64–71.

Femur IV length 2.60–3.20 mm; femur IV width 0.40–0.50 mm; leg thickness index 15–17; leg length index 94–110.

Abdomen length 3.05–3.90 mm; abdomen width 1.15–1.45 mm; abdomen index 36–41.

Description. Carapace orange-brown, with some white hairs, longer in cephalic region. Head narrow (cephalic width index 51–55) and smoothly truncated anteriorly (Fig. 180). Eyes raised—posterior eyes large and equal, anterior median eyes very much larger, anterior lateral eyes much smaller (Fig. 179). Thoracic groove moderate.

Abdomen elongated, with a smooth, median constriction, with a full red-brown sclerite, anterior half darker than the posterior half, with some white hairs in a horizontal band at the constriction (Fig. 181). Epigastric sclerite red-brown. Narrow, orange-brown ventral sclerite and a small, orange-brown inframammillary sclerite. First pair of abdominal setae very thin, second pair thin, both pair long.

Sternum shield-shaped, long, orange-brown, with some short, very fine, sparse hairs and several thin setae.

Chelicerae light-brown, with two moderately large retromargin teeth and three promargin teeth, the median larger, the proximal smaller, and the distal very much smaller than the retromargin teeth.

Coxae all cream white. Trochanter IV notch small.

Femora I–III striped with brown sides and yellow-brown ventrally and dorsally (lighter distally and darker on leg III), femur IV dark red-brown, slightly striped; rest of legs I and II light yellow-brown (except metatarsus I, brown); rest of leg III with patella, tibia, and metatarsus

striped (lateral sides brown) and tarsus yellow-brown; rest of leg IV red-brown, except a yellow-brown tarsus. Legs lightly hirsute. Tibia I ventral spination: 3–3, moderately small.

Pedipalp with a heavy, blunt, tibial apophysis. Tarsus with a large globose bulb drawn into a short thick neck and a doubly hooked terminal sclerotized section, the tip of the cymbium curved ventrally (Fig. 196).

(This is a fairly lightly pigmented specimen.)

FEMALE

Measurements. Based on 8 females: carapace length 2.95–3.50 mm; carapace width 1.65–1.95 mm; carapace index 55–57; sternum length 1.30–1.65 mm; sternum width 0.95–1.10 mm; sternum index 65–73.

Femur IV length 3.05–3.75 mm; femur IV width 0.45–0.60 mm; leg thickness index 15–17; leg length index 102–108.

Abdomen length 4.00–5.40 mm; abdomen width 1.65–2.50 mm; abdomen index 33–62; dorsal sclerite length 1.10–1.50 mm; dorsal sclerite width 0.60–0.80 mm; dorsal sclerite index 48–60.

Description. Carapace dark reddish-brown, elongated, with short whitish hairs, longer hair on cephalic region. Head narrow (cephalic width index 57–62) and smoothly truncated anteriorly. Eyes raised—posterior eyes large and equal, anterior median eyes very much larger, anterior lateral eyes much smaller. Thoracic groove moderately weak.

Abdomen elongated, slightly constricted in middle, with a very dark, red-brown, elongated, moderately small dorsal sclerite. Three horizontal bands of white hairs—one at posterior edge of sclerite, one at constriction, and one near posterior end; rest of dorsum with brownish hairs (Fig. 178). Epigastric sclerite dark red-brown. Two thin light stripes from sides of epigastric furrow to area just anterior to the

spinnerets. First pair of abdominal setae very thin and long, second pair thin and long.

Sternum shield-shaped, long, and very dark red-brown, with some short, very fine, sparse hairs.

Chelicerae very dark red-brown, with two moderately large retromargin teeth and three promargin teeth, the median larger, the proximal smaller, and the distal much smaller than the retromargin teeth.

Coxa I brown, coxae II–IV light yellow-white. Trochanter IV notch very small.

Femora deep maroon-brown, distal ends of femora I and II slightly striped; rest of legs I and II with patella-tibia yellow (sides of patella darker), metatarsi yellow-brown, tarsi yellow (leg II darker); rest of legs III and IV dark red-brown, with tarsi yellow-brown. Legs fairly lightly hirsute. Tibia I ventral spination: 3–3, long and moderately thin.

External epigynum two thin horizontal slits (Fig. 195). Internal structure with a large saclike spermathecae with two small, twisted, posterior extensions (Fig. 194).

Diagnosis. *Castianeira memnonia* differs from all other *Castianeira* in its genitalia.

Remarks. Of all the *Castianeirinae* in North and Central America, this species comes closest to that of the type-species, *Castianeira rubicunda*, with its male genitalia having the same type of twisted end as in the type-species. *C. memnonia* is probably a generalized ponerine ant mimic.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 11).

Records. CANAL ZONE. Barro Colorado Island, Diablo, Forest Reserve.

THE CUBANA GROUP

Characteristics. Small (male carapace length 1.65–2.15 mm; female carapace length 1.75–2.40 mm), with a carapace index 57–63. Cephalic region fairly wide (cephalic width index 60–73) and the carapace high and rounded. Eyes equal or

anterior median eyes larger than anterior lateral eyes. Thoracic groove weak. Female epigyna with fairly wide, slightly twisted spermathecal necks.

Discussion. This group includes the very *Myrmecotypus*-like *C. cubana* (Banks) and two other species. The presence of the thoracic groove and the eye arrangements clearly place the group in the *Castianeira*.

***Castianeira cubana* (Banks), new combination. Figures 216–219, 276. Map 11.**

Myrmecotypus cubanus Banks, 1926, Trans. Entomol. Soc. London 74:433–434, fig. 1, pl. 93, fig. 2, ♂, imm. ♀. Male holotype from Soledad, Cuba; in the Museum of Comparative Zoology, examined.

MALE

Measurements. Based on holotype and 7 males, holotype listed first, range of all follows: carapace length 1.75 mm, 1.65–1.95 mm; carapace width 1.10 mm, 1.00–1.15 mm; carapace index 64, 58–64; sternum length 0.75 mm, 0.70–0.75 mm; sternum width 0.65 mm, 0.60–0.65 mm; sternum index 83, 78–86.

Femur IV length 1.20 mm, 1.05–1.30 mm; femur IV width 0.30 mm, 0.30–0.40 mm; leg thickness index 24, 24–33; leg length index 69, 64–69.

Abdomen length 1.70 mm, 1.70–2.05 mm; abdomen width 1.20 mm, 0.95–1.25 mm; abdomen index 72, 54–73.

Embolus length 0.07 mm, 0.06–0.07 mm; bulb length 0.60 mm, 0.56–0.60 mm; male genital index 11, 10–12.

Description. Carapace orange-brown and hairless. Eyes fairly small and equal, except the anterior median eyes almost twice the diameter of anterior laterals, anterior row recurved and posterior row almost straight when viewed dorsally, the posterior row about one-fifth wider than the anterior row. Carapace somewhat narrow in cephalic region (cephalic width index 66–70) and roundly truncated anteriorly. Thoracic groove weak.

Abdomen short and drop-like, with an

almost full, dark brown dorsal sclerite and light pubescence (Fig. 276). Ventral abdomen with a dark orange-brown epigastric sclerite, and rectangular, red-brown ventral sclerite. Both pairs of abdominal setae very thin. No petiole, and pedicel very short.

Sternum dark orange-brown and fairly wide and shield-like, with no setae.

Chelicerae light orange-brown, with two moderate retromargin teeth and two promargin teeth, the distal one much larger and the proximal one slightly smaller than the retromargin teeth. A small, distinct denticle just distal and slightly median to the larger promargin tooth.

Coxa I brown, coxae II, III, and IV white. Trochanter IV notch small.

Legs red-brown, all femora and legs III and IV darker, rest of legs I and II lighter. Legs moderately hirsute. Tibia I ventral spination: 3-2, small.

Pedipalp with no tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a short, straight embolus. Distinctive looping in genital bulb (Figs. 218, 219).

FEMALE

Measurements. Based on 8 females: carapace length 1.75-2.05 mm; carapace width 1.05-1.20 mm; carapace index 58-63; sternum length 0.70-0.85 mm; sternum width 0.55-0.70 mm; sternum index 77-87.

Femur IV length 1.10-1.40 mm; femur IV width 0.30-0.35 mm; leg thickness index 23-31; leg length index 63-70.

Abdomen length 1.85-2.20 mm; abdomen width 1.30-1.85 mm; abdomen index 67-88; dorsal sclerite length 1.35-1.85 mm; dorsal sclerite width 1.30-1.60 mm; dorsal sclerite index 75-119.

Description. Carapace orange-brown and hairless. Eyes fairly small and equal, except the anterior median eyes almost twice the diameter of the anterior laterals, anterior row recurved and posterior row almost straight when viewed dorsally. Carapace somewhat narrow in cephalic region (ce-

phalic width index 64-73) and roundly truncated anteriorly. Thoracic groove weak.

Abdomen short and wide, with a large, dark red-brown dorsal sclerite; some light hairs on sclerite and dark gray-brown abdomen. Ventrums gray-brown. Both pairs of abdominal setae very thin. No petiole, pedicel very short.

Sternum shield-shaped, red-brown, with some thin hairs.

Chelicerae light orange-brown with two moderate retromargin teeth and two promargin teeth, the distal one much larger and the proximal one slightly smaller than the retromargin teeth. A small distinct denticle just distal and slightly median to the larger promargin tooth.

Coxa I brown, coxae II-IV white. Trochanter IV notch small.

Femur I red-brown, lightening to yellow distally, femora II-IV striped—dorsal, pro- and retrolateral brown striped on yellow (darker yellow in IV)—the yellow areas reinforced by light hairs. Rest of legs I and II with patellae, tibiae, and metatarsi striped—brown sides on light yellow; tarsi light yellow. Rest of III, patella-tibia red-brown (slightly striped), metatarsus red-brown, tarsus yellow-orange. Rest of leg IV, red-brown patella-tibia, dark red-brown metatarsus, orange tarsus. Legs moderately hirsute. Tibia I ventral spination: 3-2, moderately small.

External epigynum with two small, semi-circular openings directed medially (Fig. 216). Internal structure with rounded sac-like spermathecae narrower at posterior ends (Fig. 217).

Diagnosis. *C. cubana* differs from other species in the *cubana* group in its single-colored carapace, its large anterior median eyes, and its male genitalia (male genital index 10-12), which has an extra loop in the main palpal duct (Fig. 218).

Remarks. Two distinct color forms of this species exist: a Cuban-Texan-Floridian form, with an orange to red-brown carapace and a brown coxa I, and a Panamanian

form, with a deep brown-black carapace and white coxa I. The two forms have similar dimensions and genitalia.

Natural history. *Castianeira cubana* (Banks) is a mimic of *Camponotus planatus* Roger, resembling the ant both in color and gait—the first pair of legs moving “in a manner at once suggestive of the movements of an ant’s antennae” (Myers and Salt, 1926).

Distribution. Cuba, Texas, Florida, and Panama (Map 11).

Records. Florida. Dade Co. Texas. Cameron Co.

CUBA. Cienaga de Zapata, Soledad.

PANAMA. Arraijan, Boquete.

CANAL ZONE. Barro Colorado Island, Experimental Gardens, Summit.

Castianeira guapa new species

Figures 212–215, 277, 278. Map 11.

Holotype. Male from Summit, Panama Canal Zone, 23/28-VIII-1950 (A. M. Chikering); in the Museum of Comparative Zoology. The specific name is the Spanish word for handsome.

MALE

Measurements. Based on holotype and 3 males, holotype listed first, range of all follows: carapace length 2.05 mm, 1.80–2.15 mm; carapace width 1.20 mm, 1.05–1.20 mm; carapace index 59, 57–59; sternum length 0.95 mm, 0.85–0.95 mm; sternum width 0.65 mm, 0.60–0.70 mm; sternum index 68, 68–74.

Femur IV length 1.55 mm, 1.30–1.60 mm; femur IV width 0.40 mm, 0.30–0.40 mm; leg thickness index 27, 24–27; leg length index 75, 71–75.

Abdomen length 2.25 mm, 1.90–2.25 mm; abdomen width 1.30 mm, 1.10–1.30 mm; abdomen index 57, 55–58.

Embolus length 0.13 mm, 0.11–0.13 mm; bulb length 0.70 mm, 0.61–0.70 mm; male genital index 19, 18–19.

Description. Carapace with yellow-orange cephalic region, dark brown thoracic

region covered with white hairs, and long white hairs on cephalic region. Eyes moderately small, posterior eyes equal, anterior median eyes somewhat larger and anterior lateral eyes smaller than the posterior eyes. Eyes bordered in black. Carapace narrowed in cephalic region (cephalic width index 58–64) and roundly truncated anteriorly. Thoracic groove weak.

Abdomen a droplike oval (widening posteriorly), with an almost full, dark red-brown dorsal sclerite with three horizontal bands of white—a narrow one near anterior end, wide median and posterior bands (the latter of long hairs). Epigastric sclerite dark red-brown, ventral sclerite (almost full) and small inframammillary sclerite red-brown. Both pairs of abdominal setae very thin and long.

Sternum shield-shaped, orange-brown with some dark patches opposite the posterior coxae, with thin, light hairs.

Chelicerae light yellow-orange, with two moderately small retromargin teeth and two promargin teeth, the distal one larger, the proximal smaller than the retromargin teeth. Slight trace of a denticle median and distal to larger promargin tooth.

Coxa I light brown, coxae II–IV yellow-white (IV slightly darker). Trochanter IV notch small.

Femora I and II light brown lightening to yellow-white at distal end, femora III and IV dark brown with pairs of yellow with white hair stripes on both sides of femoral dorsa. Rest of legs I and II yellow-white, rest of leg III with striped patella-tibia (dark brown sides and dorsum), yellow-brown metatarsus, yellow-white tarsus, rest of leg IV with striped patella-tibia—dark brown with a single dorsal-retrolateral, yellow-white stripe—dark red-brown metatarsus and tarsus with a dark brown base and yellow-white distal half. Legs moderately hirsute. Tibia I ventral spination: 3–2, small and weak (proximal ones smaller).

Pedipalp with a moderate, blunt, tibial

apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a curved, fairly long embolus, clubbed at tip (Figs. 214, 215).

FEMALE

Measurements. Based on 2 females: carapace length 2.25–2.40 mm; carapace width 1.35–1.40 mm; carapace index 58–59; sternum length 1.00–1.05 mm; sternum width 0.75 mm; sternum index 75.

Femur IV length 1.65–1.75 mm; femur IV width 0.40 mm; leg thickness index 24; leg length index 73–74.

Abdomen length 2.60–2.85 mm; abdomen width 1.65–1.75 mm; abdomen index 61–63; dorsal sclerite length 0.90–0.95 mm; dorsal sclerite width 0.85 mm; dorsal sclerite index 87–93.

Description. Carapace with a bright yellow-orange cephalic region, dark brown thoracic region covered with some white hairs (Fig. 278). Eyes moderately small, posterior eyes equal, anterior median eyes somewhat larger and anterior lateral eyes smaller than the posterior eyes. Eyes bordered in black. Carapace narrowed in cephalic region (cephalic width index 63–66) and roundly truncated anteriorly. Thoracic groove extremely weak.

Abdomen droplike oval, with a moderate, dark red-brown dorsal sclerite and three horizontal bands of white hairs—a narrow one over the sclerite, and broad median and posterior bands over a purple-brown ground (Fig. 277). Red-brown epigastric and small inframammillary sclerites. Ventrum with a pair of light lines from each side of epigastric furrow to the posterior sclerite. First pair of abdominal setae very thin and long, second pair thin and long.

Sternum shield-shaped, orange-brown, with some dark patches opposite the posterior coxae, with thin, light hairs and a few long setae.

Chelicerae yellow, with two moderately small retromargin teeth and two promargin

teeth, the distal one larger, the proximal smaller than the retromargin teeth. Slight trace of a denticle median and distal to larger promargin tooth.

Coxa I brown, coxae II–IV creamy-white. Trochanter IV notch small.

Femora I and II light-brown lightening to yellow-white at distal end, femora III and IV dark brown with pairs of yellow with white hair stripes on both sides of femoral dorsa. Rest of legs I and II yellow-white; rest of leg III with striped patella-tibia (dark brown sides and dorsum), yellow-brown metatarsus, yellow-white tarsus; rest of leg IV with striped patella-tibia—dark brown with a single dorsal-retrolateral yellow-white stripe—dark red-brown metatarsus and tarsus with a dark brown base and yellow-white distal half. Legs moderately hirsute. Tibia I ventral spination: 3–2, moderate.

External epigynum with two very small, semicircular openings directed medially (Fig. 213). Internal structure with bag-like spermathecae with twisted necks (Fig. 212).

Diagnosis. *Castianeira guapa* differs from all other *cubana* group species in its bicolored carapace (cephalic region much lighter) and its distinctive embolus on the male pedipalp.

Remarks. This is the least *Myrmecotypus*-like of the three species in the *cubana* group, with eyes approximately equal and a moderately small dorsal abdominal sclerite.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 11).

Records. CANAL ZONE. Balboa, Barro Colorado Island, Corozal, Fort Clayton, Summit.

Castianeira abuelita new species

Figures 220, 221, 279. Map 11.

Holotype. Female from Barro Colorado Island, Panama Canal Zone, 30-VII-1954

(A. M. Chickering); in the Museum of Comparative Zoology. The specific name is from the Spanish noun meaning "grandma."

FEMALE

Measurements. Based on holotype and 3 females, holotype listed first, range of all follows: carapace length 2.25 mm, 2.25–2.30 mm; carapace width 1.40 mm, 1.40–1.45 mm; carapace index 63, 62–63; sternum length 1.05 mm, 1.05 mm; sternum width 0.80 mm, 0.80–0.85 mm; sternum index 77, 77–81.

Femur IV length 1.60 mm, 1.55–1.65 mm; femur IV width 0.50 mm, 0.45–0.50 mm; leg thickness index 32, 30–32; leg length index 70, 69–71.

Abdomen length 2.65 mm, 2.55–2.90 mm; abdomen width 1.60 mm, 1.55–1.75 mm; abdomen index 60, 60–61; dorsal sclerite length 1.55 mm, 1.35–1.65 mm; dorsal sclerite width 1.20 mm, 1.20–1.30 mm; dorsal sclerite index 79, 79–95.

Description. Carapace dark red-brown, vaulted high, with white hairs, longer in cephalic region. Eyes moderate, equal, and bordered in black. Carapace narrow in cephalic region (cephalic width index 60–63) and roundly truncated anteriorly. Thoracic groove small.

Abdomen oval, with a moderately large, red-brown dorsal sclerite (over one-half length of abdomen), and with a complex pattern of white and dark hairs—predominantly white hairs, with several complete and incomplete bands of dark hairs—a major wide dark band just posterior to the sclerite. Epigastric and very small inframammillary sclerites red-brown. Ventrums covered with white hairs. First pair of abdominal setae very thin and long, second pair thin and shorter.

Sternum shield-shaped, red-brown, and covered with light, long hairs.

Chelicerae dark red-brown, with two moderately small retromargin teeth and two promargin teeth, the distal larger and the

proximal smaller than the retromargin teeth. No denticle present.

Coxa I brown, coxae II–IV yellow-white. Trochanter IV notch moderate.

Femora I and II dark brown lightening to yellow-white distally; femur III striped—dark brown sides, yellow dorsum and ventrum (with white hairs on dorsum); femur IV deep red-brown, with some white hairs with a light yellow distal tip. Rest of legs I and II yellow-white; rest of leg III yellow with dark brown on both sides of patella and retrolateral side of tibia and metatarsus; rest of leg IV patella-tibia and metatarsus deep red-brown, with proximal end of patella and distal end of tibia yellow, the latter with heavy white hairs, white hair striping on tibia and metatarsus, tarsus yellow. Legs moderately hirsute. Tibia I ventral spination: 2–1, moderate.

External epigynum with two semicircular, small openings, opening laterally (Fig. 221). Internal structure with somewhat globose spermathecae narrowing to twisted necks (Fig. 220).

Diagnosis. *C. abuelita* differs from other *cubana* group species in the white hairs on the carapace and the hair pattern on the abdomen (Fig. 279). Also, the epigynal openings are small and directed laterally (Fig. 221).

Remarks. This species is intermediate in dorsal abdominal sclerite size and eye sizes between *C. cubana* and *C. guapa*.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 11).

Records. CANAL ZONE. Barro Colorado Island, Chilibre, France Field.

THE PEREGRINA GROUP

Castianeira peregrina (Gertsch)

Figure 207. Map 12.

Mazax peregrina Gertsch, 1935, Amer. Mus. Novit. No. 805:5, fig. 30, ♀, from 5 miles S. San Juan, Texas; in the American Museum of Natural History, examined.

Castianeira peregrina: Gertsch and Davis, 1940, Amer. Mus. Novit. No. 1069:14.

FEMALE

Measurements. Based on holotype and one female, holotype listed first, range of both follows: carapace length 1.95 mm, 1.95–2.05 mm; carapace width 1.30 mm, 1.30–1.40 mm; carapace index 67, 67; sternum length 0.90 mm, 0.90–0.95 mm; sternum width 0.75 mm, 0.75–0.85 mm; sternum index 86, 86–87.

Femur IV length 1.40 mm, 1.40–1.50 mm; femur IV width 0.35 mm, 0.35–0.40 mm; leg thickness index 26, 24–26; leg length index 72, 72–73.

Abdomen length 2.05 mm, 2.05–2.90 mm; abdomen width 1.25 mm, 1.25–1.75 mm; abdomen index 61, 61; dorsal sclerite length 1.05 mm, 0.95–1.05 mm; dorsal sclerite width 0.95 mm, 0.95–1.05 mm; dorsal sclerite index 88, 88–110.

Description. Carapace dark yellow, with some dark markings, and hairless. Head narrow (cephalic width index 53–58) and smoothly truncated anteriorly. Posterior eyes equal, anterior median eyes somewhat larger and anterior lateral eyes somewhat smaller. Eyes bordered in black. Thoracic groove moderately weak.

Abdomen oval, with a large, dark red-brown dorsal sclerite (over half the length of the abdomen), with a pair of white hair spots just posterior to the sclerite, rest of dorsum greyish purple. Epigastric and small inframammillary sclerites orange-brown. Four faint parallel stripes from the epigastric furrow towards the spinnerets. First pair of abdominal setae very thin, second pair moderately thin.

Sternum shield-shaped and wide, yellow-brown, with sparse, thin setae.

Chelicerae light yellow-brown, with two moderate retromargin teeth and two promargin teeth, the distal larger and the proximal smaller than the retromargin teeth. A minute denticle just medial and distal to the larger promargin tooth.

Coxa I very light brown, coxae II–IV light yellow-white. Trochanter IV notch moderately small.

Femora I–III striped with brown on sides and rest yellow, femur IV dark yellow-brown. Rest of legs I and II light yellow-white, rest of leg III light yellow, rest of leg IV—red-brown patella-tibia, with distinct light yellow proximal end of patella and distal end of tibia, dark red-brown metatarsus, and yellow-brown tarsus. Legs lightly hirsute. Tibia I ventral spination: 2–1, small.

External epigynum with two small, highly sclerotized, semicircular openings directed laterally (Fig. 207). Internal structure with globose spermathecae extended posteriorly as outwardly curving necks.

Diagnosis. *C. peregrina* is a small spider with the anterior median eyes larger than the laterals, but it differs from the *cubana* group in its narrower cephalic region (cephalic width index 53–58) and from the *cincta* group in the absence of any cheliceral apical “rake” or claw.

Remarks. This species is closely related to the *cubana* group, and in its large abdominal dorsal sclerite and eye size resembles *Castianeira cubana*.

Natural history. Nothing is known of the habits of this species.

Distribution. Southern Texas (Map 12).

Records. Texas. Hidalgo Co.

THE *CINCTA* GROUP

Characteristics. Very small spiders (male carapace length 1.10–1.60 mm; female carapace length 1.20–1.75 mm), with very wide carapaces (male carapace index 70–76; female carapace index 66–76) and narrow cephalic regions (male cephalic width index 47–55; female cephalic width index 51–58). A “rake” or large claw at apex of each chelicera in the females. Thoracic groove moderate to absent.

Discussion. This group includes three very distinct species whose common char-



acters are small size, wide heads, and growths at the apices of the chelicerae. These "rakes" or claws are probably adaptations to digging (like the rastellum in some mygalomorphs), though nothing is known of the habits of these spiders. For these reasons this group may well be an artificial one based on the convergence of functional characters.

***Castianeira cincta* (Banks), new combination Figures 190–193, 266, 267. Map 12.**

Myrmecotypus cinctus Banks, 1929, Bull. Mus. Comp. Zool. 69(3):60, pl. 4, fig. 56, ♀, from Mt. Hope, Panama Canal Zone; in the Museum of Comparative Zoology, examined.

MALE

Measurements. Based on 7 males: carapace length 1.25–1.45 mm; carapace width 0.90–1.05 mm; carapace index 72–75; sternum length 0.65–0.75 mm; sternum width 0.60–0.70 mm; sternum index 88–95.

Femur IV length 0.95–1.15 mm; femur

IV width 0.25–0.30 mm; leg thickness index 25–28; leg length index 75–80.

Abdomen length 1.35–1.60 mm; abdomen width 0.80–0.95 mm; abdomen index 57–61.

Embolus length 0.03–0.04 mm; bulb length 0.47–0.56 mm; male genital index 6–7.

Description. Carapace fairly wide, yellow-orange with some dark brown markings, and hairless. Eyes fairly large and almost equal, the anteriors slightly smaller than the posteriors. Head narrow (cephalic width index 52–55) and smoothly truncated anteriorly. Thoracic groove moderately weak.

Abdomen an oval with a full, orange-brown sclerite with three wide horizontal light stripes (with some white hair). Epigastric sclerite, wide rectangular ventral sclerite, and moderately large inframamillary sclerite yellow-orange. First pair of abdominal setae very thin, second pair moderate.

Sternum mottled yellow and brown, shiny, wide, and hairless.

Chelicerae light yellow, with two moderate retromargin teeth, the distal one smaller than the proximal, and two promargin teeth, the distal one slightly larger than the larger retromargin tooth, the proximal one the same size as the distal retromargin tooth. A small denticle distal to the larger promargin tooth. Row of heavy spines at promargin side of cheliceral apex.

Coxae all cream white. Trochanter IV notch moderately small.

Femora I and II yellow; femora III and IV striped—yellow with brown lateral sides. Rest of legs I and II yellow-white; rest of leg III yellow, tibia striped like femur, tarsus yellow-white. Tibia I ventral spination: 3-2, long and moderately strong, except proximal prolateral spine moderately small.

Pedipalp with a short, sharp tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a very short sclerotized embolus (Figs. 192, 193).

FEMALE

Measurements. Based on holotype and 8 females, holotype listed first, range of all follows: carapace length 1.65 mm, 1.50–1.65 mm; carapace width 1.20 mm, 1.10–1.20 mm; carapace index 75, 71–75; sternum length 0.85 mm, 0.75–0.85 mm; sternum width 0.80 mm, 0.70–0.80 mm; sternum index 96, 90–96.

Femur IV length 1.40 mm, 1.20–1.40 mm; femur IV width 0.35 mm, 0.30–0.35 mm; leg thickness index 24, 24–26; leg length index 84, 78–84.

Abdomen length 2.15 mm, 1.60–2.20 mm; abdomen width 1.45 mm, 1.15–1.55 mm; abdomen index 67, 62–78; dorsal sclerite length 0.70 mm, 0.50–0.70 mm; dorsal sclerite width 0.65 mm, 0.65–0.80 mm; dorsal sclerite index 91, 91–135.

Description. Carapace fairly wide, orange-brown, and hairless. Eyes fairly large and almost equal, the anteriors (es-

pecially the anterior median eyes) slightly smaller than the posteriors; anterior row recurved, posterior row procurved when viewed dorsally, the posterior row slightly wider than the anteriors. Carapace considerably narrowed in cephalic region (cephalic width index 54–58) and roundly truncated anteriorly. Thoracic groove moderately strong.

Abdomen oval, with a small orange-brown sclerite. Rest of dorsum grey-brown with two wide, white, horizontal stripes, one over sclerite and one in middle (Fig. 266). Abdomen with light pubescence. Ventral abdomen with an orange-brown epigastric sclerite and a small orange-brown inframammillary sclerite. First pair of abdominal setae very thin, second pair moderate and fairly short. Petiole and pedicel negligible.

Sternum orange-brown, with sparse, thin setae.

Chelicerae orange, with two moderate retromargin teeth, the distal one smaller than the proximal, and two promargin teeth, the distal one slightly larger than the larger retromargin tooth, the proximal one the same size as the distal retromargin tooth. A small denticle distal to larger promargin tooth. Row of heavy spines at promargin side of cheliceral apex (Fig. 267).

Coxae light yellow-white. Trochanter IV notch moderate.

Femora yellow-brown with red-brown sides. Rest of I and II dark yellow; rest of III light yellow-brown; patella IV yellow, tibia IV striped like femur, metatarsus IV red-brown (lighter distally), tarsus yellow-brown. Tibia I ventral spination: 3-3, long and strong.

External epigynum with two high circular openings (Fig. 191). Internal structure with globose spermathecae having narrow posterior necks (Fig. 190).

Diagnosis. *Castianeira cincta* differs from other *Castianeira* in its wide carapace (carapace index 71–75), cheliceral “rake”

in the female (Fig. 267), and the male genitalia (with a very short embolus).

Remarks. The presence of a thoracic groove and the eye arrangement clearly place this spider in the *Castianeira*.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 12).

Records. CANAL ZONE. Barro Colorado Island, Chilibre, Farfan, Mt. Hope, Summit.

Castianeira dentata Chickering

Figures 197–200, 271–273. Map 12.

Castianeira dentata Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):3–4, figs. 8, 19, 55, ♀, from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined.

Castianeira pusilla Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):7–8, figs. 3, 47, ♂, from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

MALE

Measurements. Based on 10 males: carapace length 1.40–1.60 mm; carapace width 1.05–1.15 mm; carapace index 72–76; sternum length 0.70–0.75 mm; sternum width 0.65–0.70 mm; sternum index 87–92.

Femur IV length 1.10–1.25 mm; femur IV width 0.35–0.40 mm; leg thickness index 30–34; leg length index 79–81.

Abdomen length 1.85–2.05 mm; abdomen width 0.95–1.10 mm; abdomen index 53–58.

Embolus length 0.21–0.25 mm; bulb length 0.62–0.67 mm; male genital index 17–19.

Description. Carapace dark brown and hairless. Eyes moderate, raised—posteriors equal, anterior median eyes larger and anterior lateral eyes smaller (Fig. 271). Head narrow (cephalic width index 47–50) and smoothly truncated anteriorly. Thoracic groove moderately weak.

Abdomen a wide oval, wider posteriorly, and totally covered by a deep red-brown dorsal sclerite with short plumose hairs and heavily punctate with three horizontal

bands of white hairs (Fig. 272). First pair of abdominal setae thin, second pair strong and stout.

Sternum orange-brown, with some fine hairs.

Chelicerae red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin tooth; a small denticle just median and distal to the distal promargin tooth. Four heavy, serrated setae at the promargin side of each chelicera apex (not as heavy as in the female).

Coxae I and IV light brown, coxa III tan, and coxa II creamy white. Trochanter IV notch moderately small.

Femora all dark reddish brown (lightening to light yellow at distal end). Rest of legs I and II yellow; rest of leg III with striped patella-tibia (yellow with brown sides) and yellow-brown metatarsus and tarsus; rest of leg IV red-brown, with a yellow-orange tarsus. Legs moderately hirsute. Tibia I ventral spination: 3–3, moderately small (the proximal spines much smaller).

Pedipalp with no tibial apophysis. Tarsus with globose genital bulb drawn out into a long neck with a straight, thin embolus, slightly curved near tip (Figs. 199, 200).

FEMALE

Measurements. Based on holotype and 9 females, holotype listed first, range of all follows: carapace length 1.65 mm, 1.60–1.75 mm; carapace width 1.25 mm, 1.15–1.30 mm; carapace index 75, 73–76; sternum length 0.85 mm, 0.75–0.90 mm; sternum width 0.75 mm, 0.70–0.80 mm; sternum index 89, 88–96.

Femur IV length 1.35 mm, 1.20–1.50 mm; femur IV width 0.40 mm, 0.35–0.45 mm; leg thickness index 30, 29–31; leg length index 81, 78–87.

Abdomen length 2.40 mm, 1.95–2.40 mm; abdomen width 1.65 mm, 1.40–1.80 mm;

abdomen index 69, 67–80; dorsal sclerite length 1.85 mm, 1.75–2.15 mm.

Description. Carapace fairly wide, dark orange-brown with some brown markings, and hairless. Eyes moderate, posteriors equal, anterior median eyes larger and anterior lateral eyes smaller. Eyes bordered in black. Head narrow (cephalic width index 51–57) and smoothly truncated anteriorly. Thoracic groove moderately weak.

Abdomen a wide oval, with a very large red-brown dorsal sclerite (three quarters length of abdomen), and covered with short, light hairs. Epigastric sclerite and small inframamillary sclerite red-brown. Ventrums creamy white. First pair of abdominal setae very thin, second pair moderately strong and stout.

Sternum dark yellow-brown, wide, with some fine hairs but no setae.

Chelicerae orange-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth; a small denticle just median and distal to the distal promargin tooth. Four heavy, serrated spines at the promargin side of each chelicera apex (Fig. 273).

Coxae all very light yellow, three anterior ones slightly lighter. Trochanter IV notch small.

Femora I–III striped with brown lateral sides on yellow—dark brown in femur III; femur IV dark red-brown. Rest of legs I and II light yellow-brown; rest of leg III striped like femur, except tarsus yellow-brown; rest of leg IV, patella-tibia striped with red-brown sides on yellow, metatarsus dark red-brown, tarsus yellow-brown. Legs moderately hirsute. Tibia I ventral spination: 3–3, moderately long and strong.

External epigynum with low, flared openings (Fig. 198). Internal structure of somewhat globose spermathecae with thick posterior necks (Fig. 197).

Diagnosis. A wide carapace (carapace index 72–76), small size, a heavy, fork-pronged cheliceral “rake” on the female,

and distinctive male genitalia (Fig. 200) distinguish *Castianeira dentata* from all other *Castianeira*.

Remarks. The male and female of this species were originally described as two species, but except for the cheliceral “rake” in the female, the two (*C. dentata*, the female, and *C. pusilla*, the male) are quite within the range of normal sexual dimorphism.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 12).

Records. PANAMA. Portobelo, El Valle.

CANAL ZONE. Barro Colorado Island, Chilibre, Experimental Gardens, Forest Reserve, Fort Sherman, France Field, Gamboa, Madden Dam, Summit.

Castianeira trimac new species

Figures 201–204, 268–270. Map 12.

Holotype. Male from Forest Preserve, Panama Canal Zone, VII-1939 (A. M. Chickering); in the Museum of Comparative Zoology. The specific name is an arbitrary combination of letters.

MALE

Measurements. Based on one male holotype: carapace length 1.10 mm; carapace width 0.80 mm; carapace index 70; sternum length 0.60 mm; sternum width 0.50 mm; sternum index 81.

Femur IV length 0.90 mm; femur IV width 0.20 mm; leg thickness index 23; leg length index 80.

Abdomen length 1.25 mm; abdomen width 0.75 mm; abdomen index 62.

Embolus length 0.03 mm; bulb length 0.42 mm; male genital index 6.

Description. Very small spider. Carapace yellow-brown with darker brown markings radiating from the center of the thoracic region, shiny and hairless. Eyes moderate, with anterior median eyes larger. Eyes bordered in black. Carapace narrowed in cephalic region (cephalic width index 49)

and truncated anteriorly. No thoracic groove, but a distinct impression.

Abdomen oval, with a full dorsal sclerite and a pattern of white hair bands and spots (on light background)—a horizontal band over sclerite, a divided band just posterior to sclerite, and three spots in a horizontal line at posterior end—and a wide horizontal band of dark yellow just posterior to midline, rest brown (Fig. 269). Epigastric sclerite mottled brown. Ventrum with a full yellow sclerite and a small dark brown inframammillary sclerite. Both pairs of abdominal setae extremely thin.

Sternum shield-shaped, shiny, hairless, and mottled brown—darker near each coxa.

Chelicerae light yellow-brown, with two moderately small retromargin teeth and three promargin teeth, a median one larger and a proximal one smaller than the retromargin teeth, and a very small one medial and distal to the larger promargin tooth.

Coxae cream-white (I and II with brown sides). Trochanter IV notch absent.

Femora I and II brown; femora III and IV striped dark brown sides and dorsum, rest yellow-white. Rest of leg I and II creamy white; rest of leg III striped, with patella-tibia and metatarsus yellow-white with dark brown sides, yellow-white tarsus; rest of leg IV, patella brown, tibia yellow-white with dark brown sides, metatarsus dark brown, tarsus creamy white. Legs moderately lightly hirsute. Tibia I ventral spination: 3-3, moderately long and strong.

Pedipalp with a short, blunt, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck terminating with a short, crooked embolus (Figs. 201, 202).

FEMALE

Measurements. Based on 6 females: carapace length 1.20-1.30 mm; carapace width 0.80-0.85 mm; carapace index 66-69; sternum length 0.60-0.70 mm; sternum width 0.50-0.60 mm; sternum index 82-85.

Femur IV length 0.95-1.05 mm; femur

IV width 0.20-0.25 mm; leg thickness index 22-25; leg length index 78-82.

Abdomen length 1.30-1.85 mm; abdomen width 0.80-1.10 mm; abdomen index 57-63; dorsal sclerite length 0.55-0.75 mm; dorsal sclerite width 0.50 mm; dorsal sclerite index 65-91.

Description. Very small spider. Carapace yellow-brown with darker brown markings radiating from the center of the thoracic region, shiny and hairless. Eyes moderate, with anterior median eyes larger. Eyes bordered in black. Carapace narrowed in cephalic region (cephalic width index 55-58) and truncated anteriorly. No thoracic groove, but a distinct impression.

Abdomen oval, with moderate orange-brown sclerite and a pattern of white hair bands and spots (on light background)—a horizontal band over sclerite, a divided band just posterior to sclerite, and three spots in a horizontal line at posterior end—and a wide horizontal band of dark yellow just posterior to midline, rest brown (Fig. 268). Epigastric sclerite mottled brown. Ventrum creamy white with brown-black spot just anterior to spinnerets. Both pairs of abdominal setae extremely thin.

Sternum shield-shaped, shiny, hairless, and mottled brown—darker near each coxa.

Chelicerae light yellow-brown, with two moderately small retromargin teeth and three promargin teeth, a median one larger and a proximal one smaller than the retromargin teeth, and a very small one medial and distal to the larger promargin tooth. Single large, serrated "claw" at promarginal cheliceral apex (Fig. 270).

Femora I and II brown; femora III and IV striped dark brown sides and dorsum, rest yellow-white. Rest of legs I and II creamy white; rest of leg III striped, with patella-tibia and metatarsus yellow-white with dark brown sides, yellow-white tarsus; rest of leg IV, patella brown, tibia yellow-white with dark brown sides, metatarsus dark brown, tarsus creamy white. Legs

moderately lightly hirsute. Tibia I ventral spination: 3-3, long and strong.

External epigynum with two small semi-circular openings directed posteriorly (Fig. 204). Internal structure with two elongated spermathecae, wider in middle (Fig. 203).

Diagnosis. *Castianeira trimac* differs from other *Castianeira* in its abdominal pattern (three light spots in a horizontal row at the posterior end), a single heavy "claw" at the apex of each chelicera in the females (Fig. 270), and the embolus of the male (Fig. 202).

Remarks. This is the smallest of all known species of *Castianeira*.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 12).

Records. CANAL ZONE. Barro Colorado Island, Forest Reserve, Summit.

Mazax O. P.-Cambridge

Mazax O. P.-Cambridge, 1898, Biol. Central-Americana Arachnida 1:275-276, pl. 34, fig. 2, ♀. Type-species by monotypy: *Mazax spinosa* O. P.-Cambridge, *op. cit.*, 1:276, pl. 34, fig. 2, ♀, from Teapa, Tabasco, Mexico; in the British Museum (Natural History), examined. The specific name is a junior homonym, the new name is *Mazax pax*.

Characteristics. Two rows of eyes, the posterior row wider than the anterior row; anterior row recurved, the posterior row straight or slightly procurved; eyes moderately large and approximately equal, with the anterior median eyes slightly smaller than the anterior lateral eyes.

Thoracic groove moderate to extremely weak. Cephalic region of carapace moderately narrow (cephalic width index 53-64).

Abdomen with a distinct, rugose, anterior petiole (Figs. 282-285). Constriction in male abdomen.

Tibia I ventral spination usually paired and moderately long: 3-3, 4-4, 5-5, or 6-6 (except *M. ajax* with 2-1, small spines).

Carapace length 1.60-2.85 mm, with a carapace index of 54-66 (moderate).

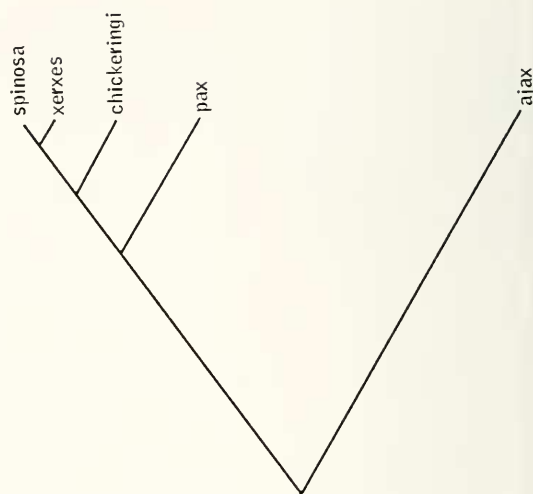


Diagram 2. A cladogram of *Mazax*.

Distribution. Mexico, West Indies, Central and South America (Map 13).

Discussion: This genus is compact and monophyletic, with the *spinosa* and *pax* groups closely related and the *ajax* group very different. Diagram 2 is a simple cladogram that shows the relationships of the species.

KEY TO THE MALES AND FEMALES OF *MAZAX*

- 1a. Tibia I ventral spination: 2-1 or 3-3 2
- 1b. Tibia I ventral spination: 4-4, 5-5, or 6-6 ... 3
- 2a. Tibia I ventral spination: 2-1; embolus long and straight (Fig. 238), spermathecae very long (Fig. 239) (southern Mexico) *ajax* p. 268
- 2b. Tibia I ventral spination: 3-3; embolus short and twisted (Fig. 236), spermathecae short (Fig. 233) (Mexico and Central America) *pax* p. 264
- 3a. Carapace bicolored (yellow-orange cephalic region, red-brown posterior thoracic region) (Fig. 280) (Costa Rica) *xerxes* p. 261
- 3b. Carapace not bicolored 4
- 4a. Male abdomen strongly impressed in middle (Fig. 283); tibia I ventral spination of females 5-5 or 6-6 (West Indies and Central America) *spinosa* p. 259
- 4b. Male abdomen weakly impressed (Fig. 282); tibia I ventral spination of females 4-4 (Jamaica) *chickeringi* p. 262

THE *SPINOSA* GROUP

Characteristics. Tibia I ventral spination 4-4 to 6-6 and carapace devoid of white hairs.

Discussion. Of the three species in this group, *Mazax spinosa* and *M. xerxes* are most clearly related. *M. chickeringi*, found only on Jamaica, is somewhat smaller and more different.

***Mazax spinosa* (Simon), new combination**
Figures 230-232, 283, 284. Map 13.

Castianeira spinosa Simon, 1897, Proc. Zool. Soc. London: 882-883, ♂, ♀. One male and four female syntypes from St. Vincent, British West Indies; in the British Museum (Natural History), examined, and male lectotype designated here. This is not *Mazax spinosa* O. P.-Cambridge, 1898 (= *Mazax pax* n.n.).

Mazax plana F. P.-Cambridge, 1899, Biol. Central-Americana Arachnida 2:83, pl. 6, fig. 11, ♀, from Guatemala; in the British Museum (Natural History), examined. NEW SYNONYMY. Chickering, 1937, Trans. Amer. Microscop. Soc. 56:33, figs. 2, 27.

Mazax segregata Chamberlin, 1925, Bull. Mus. Comp. Zool. 67:221, ♀, from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

MALE

Measurements. Based on lectotype and 10 males, lectotype, listed first, but not included in range of rest, which follows: carapace length 1.85 mm, 2.15-2.50 mm; carapace width 1.15 mm, 1.20-1.45 mm; carapace index 62, 57-59; sternum length 0.90 mm, 1.05-1.30 mm; sternum width 0.70 mm, 0.70-0.80 mm; sternum index 75, 60-70.

Femur IV length 1.60 mm, 2.05-2.45 mm; femur IV width 0.30 mm, 0.30-0.35 mm; leg thickness index 17, 14-17; leg length index 88, 90-97.

Abdomen length 2.50 mm, 2.75-3.70 mm; abdomen width 0.95 mm, 1.00-1.25 mm; abdomen index 38, 34-39; petiole length 0.40, 0.60-0.75 mm.

Embolus length 0.06 mm, 0.05-0.07 mm;

bulb length 0.69 mm, 0.73-0.85 mm; male genital index 8, 6-8.

Description. Carapace red-brown, with a lightly granulose surface, and hairless. Eyes moderately large and approximately equal, the anterior medians slightly smaller than the rest. The anterior row recurved, the posterior straight. Carapace narrowed in head region (cephalic width index 53-58) and truncated smoothly anteriorly. Thoracic groove very small and faint.

Abdomen elongated, constricted in middle, with a fairly long, rugose, anterior petiole, and covered with a full, shiny, maroon-brown dorsal sclerite (Fig. 283). Sclerite slightly lighter at constriction, with some white plumose hairs. Whole dorsum covered with sparse, simple hairs. Epigastric sclerite (forming petiole anteriorly), full ventral sclerite, and a very small inframamillary sclerite all red-brown. A pair of moderately large spines on tubercles at anterior end of dorsal sclerite (homologous to second pair of abdominal setae).

Sternum orange-brown, with some very long hairlike setae.

Chelicerae dark orange-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small denticle just distal and slightly median to the larger promargin tooth.

Coxae II and III yellow, I brown and IV orange-brown. Trochanter IV notch very shallow but present.

All femora with dark red-brown sides, but the rest of femur I with a brown base and yellow-white distally, of femur II yellow-white, of femora III and IV dark yellow. Rest of legs I and II yellow-white, with middle two thirds of metatarsus I red-brown and metatarsus II yellow; rest of leg III yellow, with sides of patella-tibia and metatarsus light red-brown, tarsus yellow-white; rest of leg IV with yellow

patella with red-brown sides, red-brown tibia with a light yellow distal tip, red-brown metatarsus, and yellow-white tarsus. Legs lightly hirsute. Tibia I ventral spination: 4-4, moderate.

Pedipalp with a small, pointed, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a small, twisted, sclerotized embolus (Fig. 230).

FEMALE

Measurements. Based on 11 females: carapace length 2.30-2.75 mm; carapace width 1.35-1.60 mm; carapace index 56-60; sternum length 1.15-1.40 mm; sternum width 0.80-0.90 mm; sternum index 65-72.

Femur IV length 2.15-2.55 mm; femur IV width 0.30-0.35 mm; leg thickness index 14-16; leg length index 91-99.

Abdomen length 2.60-3.85 mm; abdomen width 1.05-2.20 mm; abdomen index 40-60; dorsal sclerite length 0.95-1.45 mm; dorsal sclerite width 0.95-1.35 mm; dorsal sclerite index 76-105; petiole length 0.40-0.65 mm.

Description. Carapace red-brown, with a lightly granulose surface. Eyes large and approximately equal, anterior eyes recurved and posterior eyes straight when viewed dorsally. Carapace somewhat narrowed in head region (cephalic width index 57-63) and smoothly truncated anteriorly. Thoracic groove extremely small and faint.

Abdomen a long oval, with an anterior petiole and a dorsal sclerite. The petiole dark red-brown and heavily rugose; dorsal sclerite extends about two-fifths of the way back and is dark red-brown, shiny, and spineless. Abdomen almost hairless and shiny brown-grey with a thin, white, horizontal band just anterior to posterior edges of the dorsal sclerite, which covers the median portion of the band (Fig. 284). Ventral abdomen with a dark red-brown epigastric sclerite (which also forms the petiole), with two beaded stripes from

sides of sclerite posteriorly. Sides of abdomen have a large longitudinal white spot on each side. First pair of abdominal setae absent, second pair very thin and long.

Sternum orange-brown, indented slightly at each coxa, and covered with hairlike setae.

Chelicerae orange-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small denticle just distal and slightly median to the larger promargin tooth.

Coxae II and III yellow, I yellow-brown and IV light red-brown. Trochanter IV notch very shallow but present.

Femora all more or less striped, with sides brown (increasing towards IV) and light areas yellow in I and II, dark yellow in III, and yellow-brown in IV. Rest of I, II, and III light yellow; of IV yellow, with sides of tibia and metatarsus brown. Legs lightly hirsute. Tibia I ventral spination: 5-5, long and thin.

External epigynum with two, small, widely separated openings (Fig. 232). Internal structure with globose spermathecae drawn out into moderately thin posterior necks (Fig. 231).

Diagnosis. *Mazax spinosa* (Simon) differs from other *Mazax* in its monocolored carapace, the highly constricted abdomen of the male (Fig. 283), and the shiny dorsal abdominal sclerite of the female.

Remarks. The males of *M. spinosa* have a tibia I spination of 4-4, whereas the females have 5-5 and sometimes 6-6. The type is smaller than the populations measured in Panama and tends, with several other West Indian *M. spinosa*, to have a slightly rougher sculpture on the anterior half of the male abdomen.

The priority of Simon's name necessitates the change of *Mazax spinosa* O. P.-Cambridge to *Mazax pax* n.n.

Natural history. *Mazax spinosa* is found walking with a jerky gait over dead leaves

in tropical forest. The shiny abdominal sclerites and the large abdominal spines in the male suggest mimicry of certain dark myrmecine ants.

Distribution. West Indies, Central America, and Panama (Map 13).

Records. PANAMA. Boquete.

CANAL ZONE. Barro Colorado Island, Farfan, Forest Reserve, France Field, Gamboa, Gatun, Madden Dam, Pedro Miguel, Summit.

BRITISH WEST INDIES. *St. Lucia*, *St. Vincent*.

Mazax xerxes new species

Figures 226–229, 280, 281. Map 13.

Holotype. Male from Turrialba, Costa Rica, VII-23/VIII-13-1965 (A. M. Chicker-ing); in the Museum of Comparative Zoology. The specific name is a noun in apposition based on the name of a Persian king.

MALE

Measurements. Based on one male holotype: carapace length 2.30 mm; carapace width 1.35 mm; carapace index 58; sternum length 1.20 mm; sternum width 0.75 mm; sternum index 65.

Femur IV length 2.00 mm; femur IV width 0.30 mm; leg thickness index 15; leg length index 86.

Abdomen length 3.55 mm; abdomen width 1.10 mm; abdomen index 31; petiole length 0.65 mm.

Embolus length 0.07 mm; bulb length 0.85 mm; male genital index 8.

Description. Carapace with light yellow-orange cephalic and anterior thoracic regions, and dark red-brown posterior thoracic region (Fig. 280). Surface very finely granulose and hairless. Eyes large and approximately equal (anterior median eyes slightly smaller than laterals); anterior eyes recurved and the posterior eyes straight when viewed dorsally (Fig. 281). Ocular region dark red-brown. Carapace

narrowed in head region (cephalic width index 59) and truncated smoothly anteriorly. Thoracic groove extremely weak.

Abdomen elongated, constricted in middle, with a fairly long, rugose petiole, and covered with a full, shiny, maroon dorsal sclerite. Sclerite slightly lighter at constriction, with some white plumose hairs. Whole dorsum covered with sparse simple hairs. Epigastric sclerite (forming petiole anteriorly), full ventral sclerite, and a moderate inframammillary sclerite all dark red-brown. No spines or abdominal setae on the dorsal sclerite.

Sternum yellow, with some very long, hairlike setae.

Chelicerae orange-brown and reticulated brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small denticle just distal and slightly medial to the larger promargin tooth.

Coxae II and III light yellow, I yellow and IV yellowish brown. Trochanter IV notch very shallow but present.

Femur I, basal half dark red-brown, light yellow distally with brown sides; femora II, III, and IV yellow with some red-brown on the sides (only on sides of distal end of femur IV). Rest of legs I and II yellow-white (distal halves of metatarsi slightly darker); rest of leg III yellow, with red-brown sides on patella-tibia, a slightly darker metatarsus, and a creamy white tarsus; rest of leg IV with yellow patella (with a trace of red-brown on sides), dark red-brown tibia with yellow tips, metatarsus yellow with wide bands of red-brown on the sides, and light yellow tarsus. Legs lightly hirsute. Tibia I ventral spination: 5–5, long and thin, the proximal pair distinctly smaller.

Pedipalp with a small, pointed, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a small, twisted, sclerotized embolus (Figs. 228, 229).

FEMALE

Measurements. Based on one female: carapace length 2.50 mm; carapace width 1.50 mm; carapace index 59; sternum length 1.30 mm; sternum width 0.85 mm; sternum index 66.

Femur IV length 2.40 mm; femur IV width 0.35 mm; leg thickness index 15; leg length index 96.

Abdomen length 4.25 mm; abdomen width 1.85 mm; abdomen index 44; dorsal sclerite length 1.20 mm; dorsal sclerite width 1.05 mm; dorsal sclerite index 89; petiole length 0.55 mm.

Description. Carapace with light yellow-orange cephalic and anterior thoracic regions, and dark maroon-brown posterior thoracic region. Surface very finely granulate and hairless. Eyes large and approximately equal, anterior eyes recurved and the posterior eyes straight when viewed dorsally. Ocular region dark red-brown. Carapace narrowed in head region (cephalic width index 61) and truncated smoothly anteriorly. Thoracic groove extremely weak.

Abdomen oval, with an anterior maroon-brown rugose petiole and a moderately small, shiny, dark red-brown dorsal sclerite. Rest of dorsal abdomen brown-purple, with sparse light, simple hairs and a slightly lighter horizontal band at posterior edge of sclerite. Ventrums with a dark red-brown epigastric sclerite (which continues anteriorly and dorsally as the petiole), a very small red-brown inframammillary sclerite, and a pair of beaded light stripes from the sides of the epigastric furrow posteriorly. First pair of abdominal setae absent, second pair very thin and long.

Sternum orange-brown, indented slightly at each coxa, and covered with hairlike setae.

Chelicerae orange-brown and reticulated brown, with two moderate retromargin teeth and two promargin teeth, the distal

one larger and the proximal one smaller than the retromargin teeth. A very small denticle just distal and slightly median to the larger promargin tooth.

Coxae II and III light yellow, I yellow-orange, IV yellow-brown. Trochanter IV notch very shallow but present.

Femur I, basal half dark red-brown, light yellow distally with brown sides; femora II, III, and IV yellow with some red-brown on the sides (only on sides of distal end of femur IV). Rest of legs I and II yellow-white (distal halves of metatarsi slightly darker); rest of leg III yellow, with red-brown sides on patella-tibia, a slightly darker metatarsus, and a creamy white tarsus; rest of leg IV with yellow patella, yellow tibia with dark red-brown sides near proximal end, and a creamy white tarsus. Legs lightly hirsute. Tibia I ventral spination: 5-5, very long and thin.

External epigynum with two small, widely separated openings (Fig. 227). Internal structure with globose spermathecae and narrow posterior necks (Fig. 226).

Diagnosis. *Mazax xerxes* differs from all other *Mazax* in its bicolored carapace (cephalic and anterior thoracic regions yellow).

In addition to the difference in color, the male of *M. xerxes* has no dorsal abdominal spines and has a tibia I ventral spination of 5-5.

Natural history. Nothing is known of the habits of this species, though it is probably an ant mimic, and the model ant or ants probably have yellowish heads.

Distribution. Costa Rica (Map 13).

Records. COSTA RICA. Turrialba.

Mazax chickeringi new species

Figures 222-225, 282. Map 13.

Holotype. Male from Trafalger Rd., St. Andrew, Jamaica, 19/21-XI-1963 (A. M. Chickering); in the Museum of Comparative Zoology. The species is named after Dr. A. M. Chickering.

MALE

Measurements. Based on holotype and 9 males, holotype listed first, range of all follows: carapace length 2.00 mm, 1.70–2.10 mm; carapace width 1.25 mm, 1.10–1.30 mm; carapace index 63, 63–66; sternum length 1.00 mm, 0.85–1.05 mm; sternum width 0.75 mm, 0.70–0.75 mm; sternum index 77, 72–79.

Femur IV length 1.70 mm, 1.50–1.80 mm; femur IV width 0.30 mm, 0.25–0.30 mm; leg thickness index 17, 17–18; leg length index 86, 84–89.

Abdomen length 2.55 mm, 2.20–2.65 mm; abdomen width 1.05 mm, 0.95–1.15 mm; abdomen index 42, 41–45; petiole length 0.40 mm, 0.30–0.40 mm.

Embolus length 0.06 mm, 0.05–0.06 mm; bulb length 0.70 mm, 0.61–0.70 mm; male genital index 8, 7–8.

Description. Carapace deep red-brown with a finely granulose surface (heavier on thoracic region) and hairless. Eyes large and equal, except anterior median eyes somewhat smaller than the rest. Anterior row slightly recurved, posterior row straight. Carapace narrower in head region (cephalic width index 54–58) and smoothly truncated anteriorly. Thoracic groove present as a slightly elongated notch.

Abdomen dark red-brown, elongated, with an anterior rugose petiole and a full dorsal sclerite with a moderate constriction, but smooth and shiny posterior to it, with some white hairs. Epigastric sclerite, a full ventral sclerite, and a minute inframamillary sclerite red-brown. A pair of heavy dorsal spines on tubercles at anterior of abdomen (just posterior to petiole).

Sternum orange-brown, with a few hair-like, long setae. Pedicel short.

Chelicerae dark red-brown with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small, but clear, denticle

just distal and slightly median to the larger promargin tooth.

Coxae all deep yellow (posterior pair darker). Trochanter IV notch absent.

Femora all deep yellow with red-brown sides. Rest of legs I and II yellow; rest of legs III and IV dark yellow; all tarsi somewhat lighter. Legs lightly hirsute. Tibia I ventral spination: 4–4, moderately small and weak.

Pedipalp with no tibial apophysis. Tarsus with a globose bulb drawn out into a neck with a small twisted embolus at its tip. Medial palpal duct loop small (Figs. 224, 225).

FEMALE

Measurements. Based on 10 females: carapace length 1.90–2.30 mm; carapace width 1.20–1.50 mm; carapace index 62–65; sternum length 0.95–1.15 mm; sternum width 0.75–0.85 mm; sternum index 74–79.

Femur IV length 1.65–1.95 mm; femur IV width 0.30–0.35 mm; leg thickness index 17–19; leg length index 83–90.

Abdomen length 2.55–3.30 mm; abdomen width 1.30–2.30 mm; abdomen index 49–66; dorsal sclerite length 0.85–1.10 mm; dorsal sclerite width 0.90–1.10 mm; dorsal sclerite index 97–114; petiole length 0.25–0.30 mm.

Description. Carapace deep red-brown with a finely granulose surface (heavier on thoracic region) and hairless. Eyes large and equal, except anterior median eyes somewhat smaller than the rest. Anterior row slightly recurved, posterior row straight. Carapace narrower in head region (cephalic width index 57–61) and smoothly truncated anteriorly. Thoracic groove present as a slightly elongated notch.

Abdomen oval, with an anterior rugose petiole and a moderate, finely granulose, dorsal sclerite, both red-brown. Epigastric sclerite red-brown. Rest of dorsum and ventrum purplish brown, the ventrum with some light, beaded lines running from epigastric furrow to a small red-brown in-



MAP 13

- *Mazax pax*
- *M. spinosa*
- *M. chickeringi*
- ▲ *M. xerxes*
- *M. ajax*

framamilliar sclerite. Abdominal setae not discernible. No abdominal dorsal spines.

Sternum red-brown with a few hairlike, long setae. Pedicel short.

Chelicerae dark red-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small, but clear, denticle just distal and slightly median to the larger promargin tooth.

Coxae I-III deep yellow, IV yellow-orange. Trochanter IV notch absent.

Femur I red-brown; femora II-IV striped dark yellow with red-brown sides. Rest of legs I and II yellow; rest of III and IV orange, with darker patellae; all tarsi yellow-white. Legs lightly hirsute. Tibia I ventral spination: 4-4, moderately long and thin.

External epigynum with two small, flared openings (Fig. 223). Internal structure of

spermathecae with globose anterior bulb and moderately narrow necks (Fig. 222).

Diagnosis. Males of *Mazax chickeringi* have a much shallower abdominal impression than do the other *Mazax* species, and the females have a tibia I ventral spination of 4-4 (females of *M. spinosa* have 5-5 or 6-6). In addition, the horizontal light stripe on the abdomens of *M. spinosa* and *M. xerxes* is absent.

Distribution. Jamaica (Map 13).

Records. JAMAICA. *St. Ann Parish, Clarendon Parish, Kingston Parish, St. Andrew Parish, St. Catherine Parish, St. Thomas Parish.*

THE PAX GROUP

Mazax pax new name

Figures 233-236, 285. Map 13.

Mazax spinosa O. P.-Cambridge, 1898, *Biol. Centrali-Americana Arachnida* 1:276, pl. 34, fig. 2, ♀, from Teapa, Tabasco, Mexico; in the British Museum (Natural History), examined. (Not *Mazax spinosa* (Simon) 1897.)

Mazax spinosa: Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):33–34, figs. 10, 24, 68, ♂, ♀.

Name. The new specific name is a Latin noun in apposition meaning “peace.”

MALE (Mexican)

Measurements. Based on 8 males: carapace length 1.60–1.90 mm; carapace width 0.95–1.15 mm; carapace index 59–63; sternum length 0.75–0.90 mm; sternum width 0.60–0.65 mm; sternum index 71–80.

Femur IV length 1.20–1.60 mm; femur IV width 0.25–0.30 mm; leg thickness index 18–22; leg length index 72–85.

Abdomen length 2.00–2.60 mm; abdomen width 0.85–1.05 mm; abdomen index 36–46; petiole length 0.30–0.40 mm.

Embolus length 0.05–0.07 mm; bulb length 0.56–0.68 mm; male genital index 7–11.

Description. Carapace yellow-brown, with lightly granulose surface and a few white plumose hairs. Some long setae in cephalic region. Eyes moderately large, approximately equal, the anterior eyes recurved and the posterior eyes straight when viewed dorsally. Carapace narrower in head region (cephalic width index 53–61) and smoothly truncated anteriorly. Thoracic groove absent (only slight indentation remaining).

Abdomen drop-like (widening posteriorly), with an anterior red-brown rugose petiole and a full dorsal sclerite. Dorsal sclerite with a strong constriction in the middle, very rough and dark orange anterior to constriction, but smooth and shiny posterior to it, with four wide, horizontal, red-brown bands on an orange background. Sparse, simple hair over the whole dorsum. A pair of strong spines on tubercles at anterior end of dorsal sclerite. Epigastric sclerite (which also forms the petiole) red-brown. A full, yellow-orange, ventral sclerite.

Sternum yellow, with sparse, hairlike setae. Short pedicel.

Chelicerae light yellow-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small but clear denticle just distal and slightly median to the larger promargin tooth.

Coxae I–III yellow-white, coxa IV light yellow-brown. Trochanter IV notch almost absent (just a very slight dip).

Femora I and II light yellow; femora III and IV yellow-brown. Rest of legs I and II light yellow, with light red-brown metatarsus I and creamy white tarsi; rest of legs III and IV brownish yellow, with slightly darker tibia IV with light distal ends, red-brown metatarsus IV, and light, creamy white tarsi. Legs moderately hirsute. Tibia I ventral spination: 3–3, thin and weak.

Pedipalp with a small, pointed, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a small, thin, twisted embolus (Figs. 235, 236).

FEMALE (Mexican)

Measurements. Based on holotype and 8 females, holotype listed first, range of all follows: carapace length 1.80 mm, 1.80–2.20 mm; carapace width 1.10 mm, 1.10–1.30 mm; carapace index 61, 58–63; sternum length 0.90 mm, 0.90–1.10 mm; sternum width 0.65 mm, 0.65–0.75 mm; sternum index 72, 67–78.

Femur IV length 1.40 mm, 1.30–1.75 mm; femur IV width 0.30 mm, 0.30–0.40 mm; leg thickness index 21, 19–23; leg length index 77, 72–83.

Abdomen length 2.40 mm, 1.75–2.80 mm; abdomen width 1.35 mm, 1.15–1.70 mm; abdomen index 56, 54–65; dorsal sclerite length 1.40 mm, 1.00–1.65 mm; dorsal sclerite width 1.05 mm, 0.95–1.45 mm; dorsal sclerite index 77, 77–129; petiole length 0.30, 0.30–0.45 mm.

Description. Carapace light red-brown, with lightly granulose surface and very

sparse, white plumose hairs. Some long setae in cephalic region. Eyes large and approximately equal, the anterior eyes re-curved and the posterior eyes straight when viewed dorsally. Carapace narrower in head region (cephalic width index 55–63) and smoothly truncated anteriorly. Thoracic groove absent (only slight indentation remaining).

Abdomen oval, with an anterior petiole and dorsal sclerite. Petiole red-brown rugose; dorsal sclerite extends about half-way back, is red-brown and shiny, with a pair of spines on tubercles at the anterior end (Fig. 285). Whole abdomen covered with moderately long, thin hairs; greyish brown, with a thin light horizontal dorsal band about one third of the way from spinnerets. Ventral abdomen with a dark red-brown epigastric sclerite (which also forms the petiole) and two faint, beaded stripes running from the outside edges of the sclerite posteriorly.

Sternum orange, with sparse, hairlike setae. Pedicel moderately short.

Chelicerae light brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small but clear denticle just distal and slightly median to the larger promargin tooth.

Coxae I, II, and III yellow, coxa IV yellow-brown. Trochanter IV notch almost absent (just a very slight dip).

Femora I and II light brown at base and yellow-white at distal end, slightly darker on the sides; femur III brown on sides and yellow on edges; femur IV light brown. Rest of I and II yellow-white; rest of III yellow; rest of IV yellow, with light brown sections in center of tibia and proximal two thirds of metatarsus. Tibia I ventral spination: 3–3, moderately long.

External epigynum with two small, widely separated openings (Fig. 234). Internal structure with globose spermathecae

drawn out into moderately thin posterior necks (Fig. 233).

MALE (Costa Rican)

Measurements. Based on 10 males: carapace length 1.65–1.90 mm; carapace width 1.00–1.10 mm; carapace index 58–61; sternum length 0.80–0.95 mm; sternum width 0.60–0.70 mm; sternum index 71–76.

Femur IV length 1.35–1.60 mm; femur IV width 0.25–0.30 mm; leg thickness index 17–19; leg length index 78–84.

Abdomen length 2.05–2.60 mm; abdomen width 0.90–1.05 mm; abdomen index 39–43; petiole length 0.55–0.65 mm.

Embolus length 0.04–0.05 mm; bulb length 0.62–0.68 mm; male genital index 6–8.

FEMALE (Costa Rican)

Measurements. Based on 10 females: carapace length 1.90–2.20 mm; carapace width 1.10–1.30 mm; carapace index 58–62; sternum length 0.95–1.05 mm; sternum width 0.70–0.75 mm; sternum index 69–74.

Femur IV length 1.55–1.80 mm; femur IV width 0.30–0.35 mm; leg thickness index 17–19; leg length index 79–85.

Abdomen length 2.15–2.60 mm; abdomen width 1.15–1.40 mm; abdomen index 53–58; dorsal sclerite length 1.00–1.10 mm; dorsal sclerite width 1.00–1.15 mm; dorsal sclerite index 94–103; petiole length 0.40–0.50 mm.

MALE (Panamanian)

Measurements. Based on 5 males: carapace length 2.05–2.35 mm; carapace width 1.20–1.35 mm; carapace index 55–58; sternum length 1.05–1.20 mm; sternum width 0.65–0.75 mm; sternum index 62–68.

Femur IV length 1.65–1.95 mm; femur IV width 0.35–0.40 mm; leg thickness index 19–21; leg length index 81–84.

Abdomen length 2.50–2.95 mm; abdomen width 1.05–1.20 mm; abdomen index 39–46; petiole length 0.40–0.55 mm.

TABLE 2. GEOGRAPHIC FORMS OF *MAZAX PAX*.

		Localities			
		PANAMA	COSTA RICA	MEXICO-TEXAS	COLIMA
Carapace Length (in mm)	♂	2.05-2.35	1.65-1.90	1.60-1.90	—
	♀	2.30-2.75	1.90-2.20	1.80-2.20	1.90-2.20
Leg Thickness Index	♂	19-20	17-19	19-22	—
	♀	17-20	17-19	19-23	21
White plumose hairs on cara- pace		Numerous	Numerous	Very sparse	Very sparse
Dorsal abdominal sclerite ends	♀	At impression	At impression	At impression	Posterior to impression
Color	♂	Orange to brown	Brown-black	Red-brown	—
	♀	Orange to red- brown	Red-brown to brown-black	Red-brown	Red-brown

Embolus length 0.06 mm; bulb length 0.63-0.70 mm; male genital index 8-9.

FEMALE (Panamanian)

Measurements. Based on 5 females: carapace length 2.30-2.75 mm; carapace width 1.35-1.50 mm; carapace index 55-59; sternum length 1.15-1.30 mm; sternum width 0.75-0.85 mm; sternum index 61-67.

Femur IV length 1.95-2.25 mm; femur IV width 0.35-0.40 mm; leg thickness index 17-20; leg length index 82-85.

Abdomen length 2.95-3.20 mm; abdomen width 1.45-1.65 mm; abdomen index 46-54; dorsal sclerite length 1.20-1.50 mm; dorsal sclerite width 1.20-1.45 mm; dorsal sclerite index 96-104; petiole length 0.40-0.70 mm.

Diagnosis. *Mazax pax* differs from all other *Mazax* species in its tibia I ventral spination of 3-3 and the presence of some white plumose hairs on the carapace.

Remarks. The type is from Mexico, and therefore the measurements and descriptions of the Mexican form are presented first, followed by measurements of the Costa Rican and Panamanian forms. Table 2 lists the differences in these three forms plus an additional Mexican form from

Colima. Some of the discontinuities may be the result of discontinuous collecting; further collections from Mexico and Central America may clarify the situation.

This species exhibits moderately strong sexual dimorphism.

Natural history. *Mazax pax* is found on dead leaves in shady areas; it walks with an antlike gait, the first pair of legs raised to give the illusion of antennae. Both sexes appear to mimic small myrmicines.

Courtship, but not mating, of *M. pax* was observed. The male first perceives the presence of the female, often after momentarily touching her but sometimes apparently by vision. He then orients his axis at right angles to hers and stands less than an inch away. He vibrates his abdomen horizontally with three to five single jerks followed by a longer vibration. This cycle is repeated several times and then is followed by the vibration of the whole body, the spider moving rapidly up and down with all legs on the ground. This is often followed by jerky, short, forward hops while the male vibrates his pedipalps, raising the first pair of legs and the abdomen at each hop. The courtship observed was never continued beyond this

point; the female was apparently unreceptive.

M. pax spins a round, disclike, yellow-white egg case (in the same manner as *Castianeira longipalpus*—see *Natural history* under that species). Of twenty-eight egg cases studied, six had three eggs, thirteen had four eggs, seven had five eggs, and two had six eggs (an average of 4.2 eggs per case). Development time between egg laying and emergence of the spiderling from the egg case was approximately 30 days, the spiders spending their first instar in the case, emerging as second instars.

Distribution. Southernmost Texas south to Panama (Map 13).

Records. Texas. Cameron Co., Hidalgo Co., Starr Co.

MEXICO. Colima, Guerrero, Hidalgo, Oaxaca, San Luis Potosi, Tabasco, Veracruz.

COSTA RICA. Turrialba.

CANAL ZONE. Barro Colorado Island, Corozal, Fort Sherman, Gatun, Summit.

THE AJAX GROUP

Mazax ajax new species

Figures 237–240. Map 13.

Holotype. Male from 4 mi. NE of Acayucan, Mexico, 27-IV-1963 (W. J. Gertsch and W. Ivie); in the American Museum of Natural History. The specific name is a noun in apposition after the Greek warrior Ajax.

MALE

Measurements. Based on holotype and one male, holotype listed first, range of both follows: carapace length 2.95 mm, 2.65–2.95 mm; carapace width 1.60 mm, 1.50–1.60 mm; carapace index 54, 54–57; sternum length 1.35 mm, 1.35 mm; sternum width 0.85 mm, 0.85 mm; sternum index 64, 64.

Femur IV length 2.40 mm, 2.20–2.40 mm; femur IV width 0.40 mm, 0.35–0.40 mm; leg thickness index 16, 16; leg length index 82, 82–83.

Abdomen length 3.55 mm, 3.45–3.55 mm; abdomen width 1.25 mm, 1.25–1.30 mm; abdomen index 35, 35–37.

Embolus length 0.21 mm, 0.21–0.23 mm; bulb length 1.06 mm, 1.06–1.08 mm; male genital index 20, 20–21.

Description. Carapace very reddish dark red-brown, with a lightly granulose surface, and hairless. Eyes moderate and approximately equal, the anterior medians slightly smaller than the rest. The anterior row moderately recurved, and the posterior row slightly recurved. Carapace narrowed in head region (cephalic width index 59–61) and truncated smoothly anteriorly. Carapace reaching high apex longitudinally along median and falling off rapidly on both sides. Thoracic groove moderate.

Abdomen elongated (like *M. plana*), constricted in middle with a moderate rugose anterior petiole and covered with a full, dark red-brown dorsal sclerite lightly striated anterior to constriction and shiny behind it. Sclerite slightly lighter at constriction with some white plumose hairs. Whole dorsum covered with sparse, simple hairs. Epigastric sclerite (forming petiole anteriorly), almost full ventral sclerite, and small inframammillary sclerite all red-brown. No spines or abdominal setae present.

Sternum orange-brown with some very long, hairlike setae.

Chelicerae orange-brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small denticle just distal and slightly median to the larger promargin tooth.

Coxae II and III dark yellow-brown, I and IV red-brown. Trochanter IV notch small.

Femur I light yellow with dark red-brown basal half extending as two stripes to distal end; femora II and III dark yellow, with red-brown sides; femur IV orange, with red-brown sides. Rest of legs I and II yellow—retrolateral sides of

patellae-tibiae lightly red-brown, metatarsus I light red-brown, tarsi lighter; rest of leg III dark yellow—both sides of patella-tibia red-brown and tarsus light yellow; rest of leg IV—patella-tibia yellow-orange, with red-brown sides, metatarsus red-brown, tarsus light yellow. Legs lightly hirsute. Tibia I ventral spination: 2-1, very small and weak at distal end.

Pedipalp with a very small, blunt, tibial apophysis. Tarsus with a globose genital bulb drawn out into a long neck with a fairly long, strong, straight, and sclerotized embolus (Figs. 237, 238).

FEMALE

Measurements. Based on one female: carapace length 2.85 mm; carapace width 1.60 mm; carapace index 56; sternum length 1.30 mm; sternum width 0.85 mm; sternum index 68.

Femur IV length 2.20 mm; femur IV width 0.40 mm; leg thickness index 18; leg length index 77.

Abdomen length 2.75 mm; abdomen width 1.30 mm; abdomen index 48; dorsal sclerite length 0.95 mm; dorsal sclerite width 0.90 mm; dorsal sclerite index 93.

Description. This specimen is light and probably not yet full pigmented. Carapace yellow-brown, with a lightly granulose surface, and hairless. Eyes moderate and approximately equal, the anterior medians slightly smaller than the rest. Eyes bordered in black. The anterior row moderately recurved, and the posterior row slightly recurved. Carapace narrowed in head region (cephalic width index 64) and smoothly truncated anteriorly. Carapace reaching high apex longitudinally along median and falling off rapidly on both sides. Thoracic groove moderate.

Abdomen oval, with a median constriction, a moderate orange-brown, lightly granulose, dorsal sclerite anterior to the constriction, and a yellow-brown anterior petiole. Rest of dorsum and ventrum brownish purple (lighter ventrally). Epi-

gastric sclerite light yellow-brown and a very small, light red-brown, inframmillary sclerite. No spines or abdominal setae present.

Sternum pale orange-white with some very long hairlike setae.

Chelicerae pale brown, with two moderate retromargin teeth and two promargin teeth, the distal one larger and the proximal one smaller than the retromargin teeth. A very small denticle just distal and slightly median to the larger promargin tooth.

Coxae II-IV creamy white, I light purplish brown. Trochanter IV notch small.

Femur yellow-white, with a dark brown basal half and two side stripes to distal end; femora II-IV yellow-white, with brown sides (especially dark on prolateral sides of femur II). Rest of legs I-III pale yellow-white, with retrolateral side of patella-tibia III and all of metatarsus I brownish; rest of leg IV pale yellow-white, with sides of patella-tibia brownish (darker on retrolateral side) and metatarsus IV brownish. Legs lightly hirsute. Tibia I ventral spination: 2-1, very small and weak at distal end.

Epigynum very distinct, with two large, slitlike vertical openings externally (Fig. 240) and a spermatheca with an anterior bulb and a long posterior neck ending in a smaller bulb internally (Fig. 239).

Diagnosis. *Mazax ajax* differs from all other *Mazax* species in its tibia I ventral spination (2-1 and very small) and its very different genitalia (Figs. 237-240).

Remarks. While this species undoubtedly belongs to *Mazax*, it is radically different from the other four species; the divergence in genitalic characters suggests an early separation from the rest of the genus.

Natural history. Nothing is known of the habits of this species, though it is probably an ant mimic.

Distribution. Southern Mexico (Map 13).

Records. MEXICO. Mexico, Oaxaca, Veracruz.

Myrmecotypus O. P.-Cambridge

Myrmecotypus O. P.-Cambridge, 1894, Biol. Centrali-Americana Arachnida 1:123-124, pl. 18, fig. 6, ♀. Type-species by monotypy: *Myrmecotypus fuliginosus* O. P.-Cambridge, *op. cit.*, 1:124, pl. 18, fig. 6, ♀, from Teapa, Tabasco, Mexico; in the British Museum (Natural History), examined.

Characteristics. Two rows of eyes, the posterior row much wider than the anterior row; both rows moderately recurved, the anterior more strongly than the posterior (except anterior row in *M. lineatus* almost straight); posterior eyes and anterior lateral eyes fairly small and equal, with anterior median eyes about twice the diameter of the anterior lateral eyes.

Thoracic groove never present but often a slight thoracic depression in its place. Cephalic region of carapace wide (cephalic width index 64-89 with *M. pilosus* accounting for values below 72).

Tibia I ventral spination 2-2, 3-3, or 4-4. Trochanter IV notch usually absent, with only an extremely small one if present.

Carapace length 1.75-5.75 mm, with a carapace index of 39-53 (fairly narrow).

Distribution. Mexico, Central and South America.

Discussion. The genitalic differences between the species groups of *Myrmecotypus* are very great, which suggests a monophyletic origin with convergent mimetic characteristics uniting the group.

M. niger is probably somewhat related to the *olympus* group. *M. pilosus* and *M. lineatus* are atypical, the former perhaps related to some Old World forms and the latter mysteriously unique.

KEY TO THE MALES AND FEMALES OF
MYRMECOTYPUS

- 1a. Tibia I ventral spination: 2-2; eyes small; abdomen strongly constricted (Fig. 155) (eastern U. S.) *lineatus* p. 272
- 1b. Not as above, tibia I ventral spination: 3-3 or 4-4 2
- 2a. Coxae I and II bright white to yellow-white, much lighter than coxae III and IV 3
- 2b. Not as above, either coxae II and III or just coxa II light 6

- 3a. Carapace with a deep groove between the cephalic and thoracic regions; small (carapace length 1.75-2.30) 4
- 3b. No deep groove on carapace 5
- 4a. Dark brown-black carapace; distinct male and female genitalia (Figs. 253-257) (Panama) *orpheus* p. 277
- 4b. Orange-brown carapace; distinct male and female genitalia (Figs. 258-261) (Panama) *olympus* p. 275
- 5a. Large (carapace length 5.15-5.75 mm) with a longitudinal row of erect, dense hairs on thoracic region; distinct genitalia (Figs. 262-265) (Panama) *rettenmeyeri* p. 278
- 5b. Smaller (carapace length 2.45-2.65 mm) with distinct genitalia (Figs. 241-244) (Panama) *niger* p. 274
- 6a. Coxa II light yellow-white, rest of the coxae dark; long simple hairs on abdomen; distinct genitalia (Figs. 245-248) *pilosus* p. 280
- 6b. Coxae II and III much lighter than coxae I and IV 7
- 7a. External epigynum as in Fig. 251 (Mexico) *fuliginosus* p. 270
- 7b. External epigynum as in Fig. 250 (Panama) *lineatipes* p. 271

THE *FULIGINOSUS* GROUP

Characteristics. Coxae II and III yellow-white to white, other coxae darker. External epigynal openings moderate to small and medially directed. Tibia I ventral spination 3-3.

Discussion. The two species in this group, *Myrmecotypus fuliginosus* and *M. lineatipes*, are only known from a single female in each case and are closely related.

Myrmecotypus fuliginosus O. P.-Cambridge
Figures 251, 252. Map 14.

Myrmecotypus fuliginosus O. P.-Cambridge, 1894, Biol. Centrali-Americana Arachnida 1:124, pl. 18, fig. 6, ♀, from Teapa, Tabasco, Mexico; in the British Museum (Natural History), examined.

FEMALE

Measurements. Based on one female holotype: carapace length 2.35 mm; carapace width 1.20 mm; carapace index 52; sternum length 1.05 mm; sternum width 0.65 mm; sternum index 61.

Femur IV length 1.60 mm; femur IV width 0.35 mm; leg thickness index 21; leg length index 67.

Abdomen length 2.50 mm; abdomen width 1.95 mm; abdomen index 79; dorsal sclerite length 0.80 mm; dorsal sclerite width 0.80 mm; dorsal sclerite index 100.

Description. Carapace red-brown with some white hairs. Eyes small and equal, except the anterior median eyes almost twice the diameter of anterior laterals; both rows recurved when viewed dorsally, the posterior row almost two-fifths wider than the anterior row. Carapace somewhat narrowed in head region (cephalic width index 72) and squarely truncated anteriorly. Thoracic groove absent.

Abdomen wide, with a fairly small, red-brown dorsal sclerite, and covered with some white plumose hairs. Epigastric sclerite red-brown. Ventrums orange-brown. Small inframamillary sclerite orange-brown. First pair of abdominal setae thin and long, second pair moderate and long.

Sternum red-brown, elongate, shield-shaped, slightly pinched at coxa III, and with some light hairs.

Chelicerae red-brown, with two moderate retromargin teeth, the distal a bit smaller than the proximal, and two promargin teeth, the distal one much larger and the proximal slightly smaller than the retromargin teeth.

Coxae I and IV dark orange-brown; II and III pale yellow-white. Trochanter IV notch very small.

Femur I with brown basal half and light yellow distal half, with a dorsal brown stripe; femur II yellow, with brown sides and short dorsal stripe at distal end; femora III and IV dark orange-brown. Rest of legs I and II—patellae-tibiae and metatarsi striped yellow, with brown sides, tarsi yellow; rest of leg III—patella-tibia dark red-brown, with yellow-orange tarsus. Legs lightly hirsute. Tibia I ventral spination: 3-3, very long and moderately thin.

External epigynum with two small open-

ings at lateral ends of a horizontal lip (Fig. 251). Internal structure with two globose spermathecae with wide necks extending posteriorly (Fig. 252).

Diagnosis. *Myrmecotypus fuliginosus* differs from *M. lineatipes* in its much smaller epigynal openings.

Natural history. Nothing is known of the habits of this species.

Distribution. Known only from its type locality in Tabasco, Mexico (Map 14).

Records. MEXICO. Tabasco.

Myrmecotypus lineatipes Chickering

Figures 249, 250. Map 14.

Myrmecotypus lineatipes Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):34-35, figs. 1, 32, ♀, from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined.

FEMALE

Measurements. Based on one female holotype: carapace length 3.10 mm; carapace width 1.50 mm; carapace index 49; sternum length 1.30 mm; sternum width 0.75 mm; sternum index 58.

Femur IV length 2.30 mm; femur IV width 0.45 mm; leg thickness index 19; leg length index 73.

Abdomen length 3.20 mm; abdomen width 2.40 mm; abdomen index 75; dorsal sclerite length 0.85 mm; dorsal sclerite width 0.95 mm; dorsal sclerite index 115.

Description. Carapace brown-black with long, thin, white hairs. Eyes small and equal except the anterior median eyes almost twice the diameter of anterior laterals; both rows recurved when viewed dorsally, the posterior row one third wider than the anterior row. Carapace only slightly narrowed in head region (cephalic width index 79) and squarely truncated anteriorly. Thoracic groove absent with a slight depression in its place.

Abdomen short and wide, with a fairly small, brown-black dorsal sclerite. Abdomen covered with heavy yellowish pubescence and longer, sparser hairs. Ventral

abdomen with a dark red-brown epigastric sclerite. First pair of abdominal setae very thin, second pair moderately thin. Pedicel fairly short.

Sternum brown-black, elongate, and pinched slightly at coxa III, with very sparse, thin setae.

Chelicerae moderately brown-black, with two moderate teeth, the distal a bit smaller than the proximal one, and two promargin teeth, the distal one much larger and the proximal one slightly smaller than the retro-margin teeth.

Coxa I moderately brown-black, IV dark brown-black, and II and III brilliant white. Trochanter IV notch absent.

Femora I and II striped, with a thin dorsal and partial lateral black-brown stripes on yellow-white ground, femora III and IV black-brown (somewhat lightened at distal end); patellae-tibiae I and II with lateral dark stripes, metatarsus I also striped, but II dark yellow; tarsi I and II yellow white; rest of III and IV gradually lightening from black-brown to red-brown, with patellae, distal end of tibiae and tarsi much lighter. Tibia I ventral spination: 3-3.

External epigynum with two fairly large flared openings (Fig. 250). Internal structure with somewhat globose spermathecae having posterior thin necks (Fig. 251).

Diagnosis. *Myrmecotypus lineatipes* differs from *M. fuliginosus* in its much larger epigynal openings.

Remarks. *M. lineatipes* is very closely related to *M. fuliginosus*, differing slightly in genitalia and size.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 14).

Records. CANAL ZONE. Barro Colorado Island.

THE *LINEATUS* GROUP

Myrmecotypus lineatus (Emerton), new combination Figures 111, 112, 153-155. Map 15.

Castianeira lineata Emerton, 1909, Trans. Connecticut Acad. Sci. 14(3):216, pl. 10, fig. 5, ♀, from Sharon, Massachusetts; in the Museum of Comparative Zoology, examined.

FEMALE

Measurements. Based on holotype and 6 females, holotype listed first, range of all follows: carapace length 2.70 mm, 2.35-2.75 mm; carapace width 1.40 mm, 1.20-1.40 mm; carapace index 52, 48-53; sternum length 1.20 mm, 1.05-1.25 mm; sternum width 0.70 mm, 0.70-0.75 mm; sternum index 55, 55-70.

Femur IV length 2.35 mm, 2.00-2.40 mm; femur IV width 0.30 mm, 0.30-0.35 mm; leg thickness index 14, 13-15; leg length index 87, 80-90.

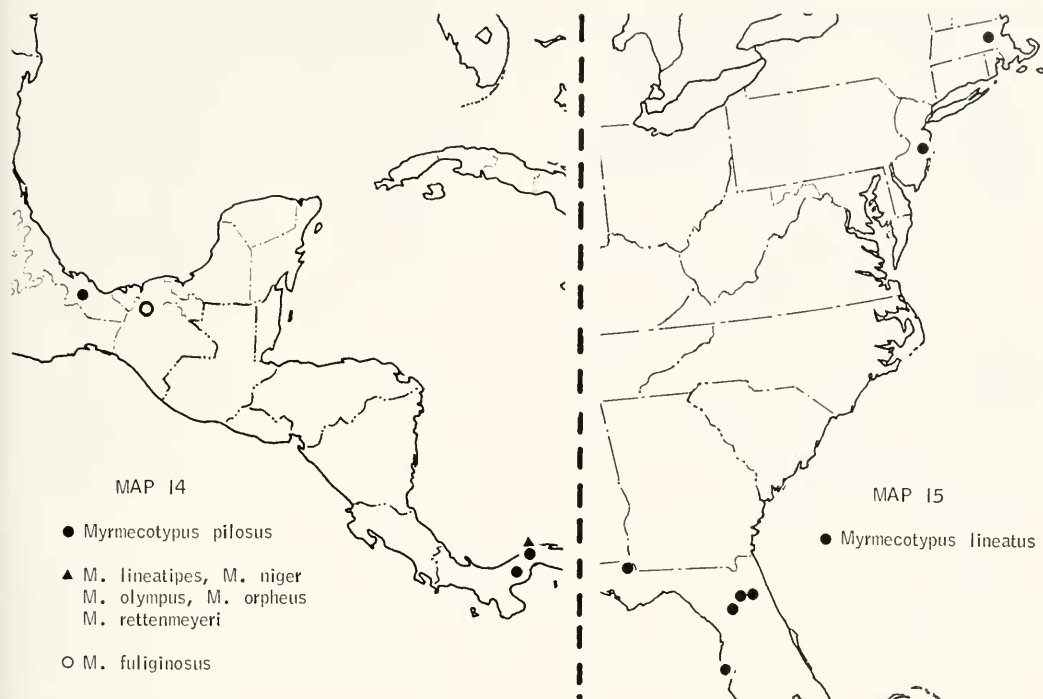
Abdomen length 2.85 mm, 2.85-3.60 mm; abdomen width 1.40 mm, 1.20-2.25 mm; abdomen index 49, 39-65; dorsal sclerite length 0.80 mm, 0.65-1.00 mm; dorsal sclerite width 0.60 mm, 0.50-0.60 mm; dorsal sclerite index 76, 58-76.

Description. Carapace yellow-orange, hairless and long, slightly darker in cephalic region. Cephalic region quite wide (cephalic width index 72-78) and truncated anteriorly. Eyes very small, equal (anterior median eyes slightly larger than anterior lateral eyes) and bordered in black (Fig. 153). Carapace narrows considerably behind, with posterior end raised slightly (Fig. 154). Thoracic groove absent, but a small longitudinal impression present.

Abdomen long oval, with a very strong median constriction and a moderate yellow dorsal sclerite. Two thin horizontal white hairs bands—one over the sclerite and one at constriction. Posterior third of abdomen dark purple-brown, with several pairs of light spots (Fig. 155). Epigastric sclerite light yellow. Ventrums creamy white. First pair of abdominal setae very thin and long, second pair moderate and fairly stout.

Sternum shield-shaped, long, light yellow, with a few long, very thin setae. Pedicel moderately long.

Chelicerae orange, with two moderately



small retromargin teeth and two promargin teeth, the distal larger and the proximal smaller than the retromargin teeth; an extremely small denticle just medial and distal to the larger promargin tooth. Several fairly thick, serrated setae at promargin chelicerae apex.

Coxa I light tan, II and III creamy white, IV yellow-white. Trochanter IV notch absent.

Legs very thin. Femora striped—I and II light yellow-white, with dark brown dorsal and prolateral stripes, III yellow, with dorsal and lateral red-brown stripes, IV dark yellow, with dorsal and retrolateral light red-brown stripes. Rest of legs I and II yellow-white; rest of leg III—patella-tibia yellow, slightly striped, metatarsus and tarsus light yellow; rest of leg IV—patella yellow, tibia striped like femur IV, metatarsus red-brown, tarsus creamy white. Legs lightly hirsute. Tibia I ventral spination: 2-2, thin and long.

External epigynum with two small circu-

lar openings (Fig. 112). Internal structure with rounded spermathecae and wide posterior necks (Fig. 111).

Diagnosis. *Myrmecotypus lineatus* differs from all other *Myrmecotypus* in its small eyes (Fig. 153), its tibia I ventral spination (2-2), and its abdominal shape and pattern (Fig. 155).

Remarks. This species is found along the eastern seaboard of the U.S. from Massachusetts to Florida. It is most abundant in Florida, which is probably the center of its distribution, with Massachusetts (the type locality) a peripheral area.

This atypical *Myrmecotypus* is not closely related to any other species.

Natural history. Nothing is known of the habits of this species.

Distribution. Massachusetts to Florida (Map 15).

Records. *Florida.* Alachua Co., Bradford Co., Clay Co., Jackson Co., Pinellas Co. *Massachusetts.* Norfolk Co., *New Jersey.* Ocean Co.

Myrmecotypus niger Chickering

Figures 241–244, 286. Map 14.

Myrmecotypus niger Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):35–37, figs. 42, 54, ♂, from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined.

MALE

Measurements. Based on one male holotype: carapace length 2.45 mm; carapace width 1.10 mm; carapace index 46; sternum length 1.10 mm; sternum width 0.65 mm; sternum index 57.

Femur IV length 1.65 mm; femur IV width 0.35 mm; leg thickness index 20; leg length index 68.

Abdomen length 1.90 mm; abdomen width 1.35 mm; abdomen index 71.

Embolus length 0.08 mm; bulb length 0.75 mm; male genital index 11.

Description. Carapace dark reddish brown, with thin, long, white hair. A distinct, shallow, horizontal impression between the cephalic and thoracic regions. Eyes small and equal except the anterior median eyes almost twice the diameter of anterior laterals; both rows recurved when viewed dorsally, the posterior row one-half wider than the anterior row. Carapace only slightly narrowed in head region (cephalic width index 86) and squarely truncated anteriorly. Thoracic groove absent, with a depression in its place.

Abdomen short and rounded, with three-fourths full red-brown dorsal sclerite covered with fairly long white pubescence. Ventral abdomen with a red-brown epigastric sclerite, a square ventral sclerite posterior to the epigastric furrow, and a small inframammillary sclerite. Abdominal setae very long—first pair very thin, second pair moderately thin. Short rugose petiole and a short pedicel.

Sternum deep maroon, with sparse, hair-like setae.

Chelicerae dark red-brown, with two moderately small retromargin teeth and two promargin teeth, the distal one much larger

than, and the proximal one the same size as, the retromargin teeth. A very small denticle just distal and slightly median to the larger promargin tooth.

Coxa I light yellow-brown, II yellow-white, III and IV brown-black. Trochanter IV notch absent.

Leg I missing. Femora red-brown, darkening from II to IV. Patella-tibia and metatarsus II laterally striped with brown-black. Rest of legs III and IV red-brown. Legs lightly hirsute.

Pedipalp with no tibial apophysis. Tarsus with a globose genital bulb drawn out into a short neck with two sclerotized terminal structures—a straight embolus and a hooked conductor (Figs. 243, 244).

FEMALE

Measurements. Based on one female: carapace length 2.65 mm; carapace width 1.20 mm; carapace index 45; sternum length 1.15 mm; sternum width 0.60 mm; sternum index 50.

Femur IV length 1.80 mm; femur IV width 0.30 mm; leg thickness index 18; leg length index 68.

Abdomen length 2.05 mm; abdomen width 1.75 mm; abdomen index 87; dorsal sclerite length 1.45 mm; dorsal sclerite width 1.75 mm; dorsal sclerite index 122.

Description. Carapace dark maroon-brown with light, low pubescence. A distinct shallow impression between the cephalic and thoracic regions. Black hair bands starting at impression and running laterally and posteriorly (Fig. 286). Eyes small and equal except the anterior median eyes almost twice the diameter of anterior laterals, both rows recurved when viewed dorsally, the posterior row two-fifths wider than the anterior row. Carapace only slightly narrowed in cephalic region (cephalic width index 89) and squarely truncated anteriorly. Thoracic groove absent, with a distinct depression in its place.

Abdomen short and rounded with an almost three-fourths full, maroon-brown,

dorsal sclerite. Rest of dorsum and ventrum blackish. Epigastric and small inframamillary sclerites red-brown.

Sternum deep maroon with sparse, hair-like setae.

Chelicerae dark red-brown, with two moderately small retromargin teeth and two promargin teeth, the distal one much larger than, and the proximal one the same size as, the retromargin teeth. A very small denticle just distal and slightly median to the larger promargin tooth.

Coxa I light yellow-brown, II yellow-white, III and IV brown-black. Trochanter IV notch absent.

Femur I basally yellow, distally white, with a thin ventral and a moderate dorsal red-brown stripe; femur II yellow with orange-brown sides; femora III and IV orange-brown. Rest of leg I—patella-tibia yellow-white with dark red-brown sides, metatarsus dark red-brown, tarsus creamy white; rest of leg II—patella-tibia and metatarsus yellow-white with red-brown sides, tarsus light yellow; rest of legs III and IV orange-brown, distal half of tarsi light yellow. Legs lightly hirsute. Tibia I ventral spination: 4-4, moderately long.

External epigynum with two flared openings (Fig. 242). Internal structure with long, globose spermathecae with thick necks and very thin bursae copulatrices (Fig. 241).

Diagnosis. *Myrmecotypus niger* differs from other *Myrmecotypus* in its wide cephalic region (male cephalic width index 86, female 89), male genitalia (with two pronged terminal processes on the genital bulb), female genitalia, and tibia I ventral spination (4-4).

Remarks. *M. niger* resembles *M. rettenmeyeri* in coxae color pattern and high values for the cephalic width index, but the genitalia are quite different.

Natural history. Nothing is known of the habits of this species.

Distribution. Panama (Map 14).

Records. CANAL ZONE. Barro Colorado Island, Summit.

THE OLYMPUS GROUP

Characteristics. Coxae I and II are white, other coxae much darker. Tibia I ventral spination 3-3. Male genital bulb with both loops lateral to the main palpal duct.

Myrmecotypus olympus new species

Figures 258-261, 289. Map 14.

Holotype. Male from Barro Colorado Island, Panama Canal Zone, 18-VII-1954 (A. M. Chickering); in the Museum of Comparative Zoology. The specific name is a noun in apposition after the mythical abode of the Greek gods.

MALE

Measurements. Based on one male holotype: carapace length 2.25 mm; carapace width 1.10 mm; carapace index 50; sternum length 0.95 mm; sternum width 0.60 mm; sternum index 60.

Femur IV length 1.65 mm; femur IV width 0.30 mm; leg thickness index 20; leg length index 73.

Abdomen length 1.75 mm; abdomen width 1.20 mm; abdomen index 70.

Genital bulb length 0.83 mm.

Description. Fairly small spider. Carapace with a very strong wide groove between the cephalic and thoracic region; orange-brown, with some short white pubescence. Eyes in two recurved rows, the posterior row about two-fifths wider than the anterior row; the posterior eyes moderately small and equal, the anterior medians larger and the anterior laterals smaller than the posterior eyes. Eyes bordered in black. Cephalic region narrower than the thoracic region (cephalic width index 72) and squarely truncated anteriorly. Thoracic groove absent.

Abdomen oval, with an almost full orange-brown sclerite and a thin yellow horizontal band. Epigastric and moderately large ventral sclerite light yellow-brown.

Moderately large brownish inframamillary sclerite. First pair of abdominal setae very thin, second pair moderate.

Sternum shield-shaped and elongated, mottled brown and yellow, with some long, light hairs.

Chelicerae pale yellow-brown with two moderately small retromargin teeth and two promargin teeth, the distal larger and the proximal slightly smaller than the retromargin teeth; a moderately strong denticle medial and distal to the larger retromargin tooth.

Coxae I and II brilliant white, coxae III and IV pale yellow-brown. Trochanter IV notch absent.

Femora I and II striped creamy white, with a dark brown stripe on each side of dorsum; femora III and IV reddish brown (with ventrum and dorsum of III light yellow and base of IV yellow). Rest of I and II with striped patellae-tibiae and metatarsi (yellow-white with brown sides) and creamy white tarsi; rest of III and IV dark reddish yellow-brown, with white patella IV and light yellow-white tarsi. Legs moderately lightly hirsute. Tibia I ventral spination: 3-3, moderately thin and short.

Pedipalp with no tibial apophysis. Tarsus with a globose bulb drawn out into a short neck with a strong, curved embolus. Palpal ducts with two loops both lateral to the embolus tube (Fig. 260). A group of thick, heavy spines near the base of cymbium, near lateral edge (Fig. 261).

FEMALE

Measurements. Based on one female: carapace length 2.30 mm; carapace width 1.10 mm; carapace index 47; sternum length 1.00 mm; sternum width 0.60 mm; sternum index 61.

Femur IV length 1.65 mm; femur IV width 0.30 mm; leg thickness index 19; leg length index 72.

Abdomen length 2.20 mm; abdomen width 1.65 mm; abdomen index 75; dorsal

sclerite length 1.50 mm; dorsal sclerite width 1.50 mm; dorsal sclerite index 100.

Description. Fairly small spider. Carapace with a very strong, wide groove between the cephalic and thoracic region. Cephalic region orange-brown and hairless, thoracic region red-brown with some long hairs, with some dark markings in the center. Eyes in two recurved rows, the posterior row about two-fifths wider than the anterior row; the posterior eyes moderately small and equal, the anterior medians larger and the anterior laterals smaller than the posterior eyes. Eyes bordered in black. Cephalic region narrower than the thoracic region (cephalic width index 81) and squarely truncated anteriorly. Thoracic groove absent.

Abdomen a wide oval, with a moderately large red-brown dorsal sclerite with a horizontal yellow stripe across it (Fig. 289). Rest of dorsum and ventrum brownish purple. Epigastric and small inframamillary sclerites red-brown. First pair of abdominal setae very thin, second pair moderately thin.

Sternum shield-shaped and elongated, mottled brown and yellow, with some long, light hairs.

Chelicerae deep yellow, with two moderately small retromargin teeth and two promargin teeth, the distal larger and the proximal slightly smaller than the retromargin teeth; a strong denticle medial and distal to the larger retromargin tooth. About eight heavy, serrated setae at promarginal apex of each chelicerae.

Coxae I and II brilliant white, coxae III and IV dark yellow-brown. Trochanter IV notch absent.

Femora I and II striped creamy white, with a dark brown stripe on each side of dorsum; femora III and IV dark red-brown (slightly darker on sides). Rest of legs I and II with striped patellae-tibiae (light yellow with brown sides), red-brown metatarsi, yellow-white tarsi; rest of legs III and IV red-brown, with light yellow patella IV,

yellow-white tarsus III, and yellow-orange tarsus IV. Legs moderately lightly hirsute. Tibia I ventral spination: 3-3, moderately thin and very long.

External epigynum with two anteriorly directed semicircular openings (Fig. 258). Internal structure with bursae copulatrices running to globose spermathecae having wide necks (Fig. 259).

Diagnosis. *Myrmecotypus olympus* has a strong impression between the thoracic and cephalic regions, is orange-brown, and has distinctive male and female genitalia.

Remarks. This species is closely related to *M. orpheus*, and the male genitalia, with its double lateral loop and low twist, suggests a relationship with the highly modified *M. rettenmeyeri*.

Natural history. Nothing is known of the habits of this spider, but its general appearance is antlike, probably mimicking some small formicine ants.

Distribution. Panama (Map 14).

Records. CANAL ZONE. Barro Colorado Island.

Myrmecotypus orpheus new species

Figures 253-257, 288. Map 14.

Holotype. Male from Summit Gardens, Panama Canal Zone, 12-V-1964 (A. M. Chickering); in the Museum of Comparative Zoology. The specific name is a noun in apposition after the mythical Greek lover Orpheus.

MALE

Measurements. Based on holotype and one male, holotype listed first, range of both follows: carapace length 1.75 mm, 1.75-1.95 mm; carapace width 0.90 mm, 0.90-0.95 mm; carapace index 51, 48-51; sternum length 0.75 mm, 0.75-0.80 mm; sternum width 0.45 mm, 0.45 mm; sternum index 63, 56-63.

Femur IV length 1.30 mm, 1.30-1.40 mm; femur IV width 0.25 mm, 0.25 mm; leg thickness index 20, 19-20; leg length index 75, 71-75.

Abdomen length 1.50 mm, 1.40-1.50 mm; abdomen width 1.10 mm, 0.95-1.10 mm; abdomen index 72, 67-72.

Embolus length 0.03 mm, 0.03 mm; bulb length 0.44 mm, 0.44-0.51 mm; male genital index 7, 6-7.

Description. Fairly small spider. Carapace shiny reddish brown-black, with a deep groove between the cephalic and thoracic regions, reinforced on the sides with some white hairs, and very sparse white hairs elsewhere. Eyes in two recurved rows, the posterior row about two-fifths wider than the anterior row; the posterior eyes moderately small and equal, the anterior medians larger and the anterior laterals smaller than the posterior eyes. Cephalic region narrower than the thoracic region (cephalic width index 75-79) and squarely truncated anteriorly. Thoracic groove absent.

Abdomen a wide oval, with a four-fifths full, shiny, dark red-brown dorsal sclerite with a few light hairs. Epigastric, ventral (one-half) and small inframamillary sclerites yellow-brown. First pair of abdominal setae extremely thin, second pair very thin.

Sternum shield-shaped and elongated, dark red-brown, with some long, light hairs.

Chelicerae yellow-brown, with two moderately small retromargin teeth and two promargin teeth, the distal larger and the proximal slightly smaller than the retromargin teeth; a strong denticle medial and distal to the larger retromargin tooth.

Coxae I and II white, coxae III and IV brown-black. Trochanter IV notch absent.

Femora I and II white, I with brown-black spot at prolateral base, II with prolateral brown-black stripe; femora III and IV dark brown-black (IV with a white base). Rest of legs I and II—both patellae-tibiae and metatarsus II light yellow with brown sides, metatarsus I dark red-brown, tarsi creamy white; rest of legs III and IV brown-black, with white patella IV and

white tarsi. Legs lightly hirsute. Tibia I ventral spination: 3-3, moderate.

Pedipalp with no tibial apophysis. Tarsus small, with a globose bulb drawn out into a short, wide neck with a short, pointed embolus (Figs. 255-257). Reservoir tubes with two loops, both lateral to the embolus tube.

FEMALE

Measurements. Based on 2 females: carapace length 2.25-2.30 mm; carapace width 1.05-1.10 mm; carapace index 47-49; sternum length 1.00 mm; sternum width 0.60 mm; sternum index 61.

Femur IV length 1.60-1.65 mm; femur IV width 0.30 mm; leg thickness index 18; leg length index 72.

Abdomen length 2.05-2.20 mm; abdomen width 1.60-1.70 mm; abdomen index 78; dorsal sclerite length 1.45-1.50 mm; dorsal sclerite width 1.50-1.60 mm; dorsal sclerite index 104.

Description. Fairly small spider. Carapace shiny reddish brown-black with a deep groove between the cephalic and thoracic regions, reinforced on the sides with some white hairs, and very sparse white hairs elsewhere (Fig. 288). Eyes in two recurved rows, the posterior row about two-fifths wider than the anterior row; the posterior eyes moderately small and equal, the anterior medians larger and the anterior laterals smaller than the posterior eyes. Cephalic region narrower than the thoracic region (cephalic width index 74-76) and squarely truncated anteriorly. Thoracic groove absent.

Abdomen a wide oval, with a three-quarters full, shiny, very dark red-brown dorsal sclerite with a faint, horizontal red-brown band. Rest of dorsum and ventrum purplish brown. Epigastric and small inframammillary sclerite dark red-brown. First pair of abdominal setae extremely thin, second pair very thin.

Sternum shield-shaped and elongated, dark red-brown with some light, long hairs.

Chelicerae red-brown, with two moderately small retromargin teeth and two promargin teeth, the distal larger and the proximal slightly smaller than the retromargin teeth; a strong denticle medial and distal to the larger retromargin tooth. About eight heavy, serrated setae at promarginal apex of each chelicerae.

Coxae I and II white, coxae III and IV brown-black. Trochanter IV notch absent.

Femora I and II yellow-white, I with dark brown retrolateral dorsal stripe, II with retro- and prolateral stripes; femora III and IV dark reddish brown-black. Rest of legs I and II—patellae-tibiae and metatarsi light yellow with sides brown, tarsi yellow-white; rest of legs III and IV dark reddish brown-black with light whitish patella IV and light yellow tarsi. Legs lightly hirsute. Tibia I ventral spination: 3-3, moderately long and strong.

External epigynum with two anteriorly directed, semi-circular openings (Fig. 258). Internal structure with bursae copulatrices running to globose spermathecae with wide necks (Fig. 259).

Diagnosis. *Myrmecotypus orpheus* has a strong impression between thoracic and cephalic regions, is dark brown-black, and has distinctive male and female genitalia.

Remarks. (See *Remarks* under *M. olympus*.)

Natural history. Nothing is known of the habits of this spider, but its general appearance is antlike, probably mimicking some small formicine ant.

Distribution. Panama (Map 14).

Records. CANAL ZONE. Barro Colorado Island, Forest Reserve, Summit.

Myrmecotypus rettenmeyeri Unzicker

Figures 262-265, 287. Map 14.

Myrmecotypus rettenmeyeri Unzicker, 1965, J. Kansas Entomol. Soc. 38(3):253-256, figs. 1, 2 ♂, from Barro Colorado Island, Panama Canal Zone; in the Kansas State University Museum, examined. Reiskind, 1966, Psyche 72(4) "1965": 279-281, fig. 1.

Myrmecotypus discreta Unzicker, 1965, J. Kansas Entomol. Soc. 38(3):256-257, figs. 3, 4, ♀, from Barro Colorado Island, Panama Canal Zone; in the Kansas State University Museum, examined.

MALE

Measurements. Based on one male: carapace length 5.15 mm; carapace width 2.05 mm; carapace index 39; sternum length 2.40 mm; sternum width 0.95 mm; sternum index 39.

Femur IV length 4.50 mm; femur IV width 0.65 mm; leg thickness index 14; leg length index 88.

Abdomen length 3.65 mm; abdomen width 2.40 mm; abdomen index 66.

Description. A large spider. Carapace long and narrow, deep maroon-brown, with a weak horizontal impression between the cephalic and thoracic regions, and covered with low hairs, with white hair on posterior side of the impression and a band of black hairs just behind the white, off to the sides; a longitudinal band of erect black hairs down back of thoracic region (Fig. 287). Eyes small and equal, except anterior median eyes about two times the diameter of anterior lateral eyes. Both rows of eyes recurved, posterior row about one-third wider than anterior row. Thoracic groove absent. Cephalic region narrower than thoracic region (cephalic width index 76).

Abdomen oval (wider posteriorly), with a seven-eighths full, maroon-brown dorsal sclerite, with long silvery hair and two thin horizontal black bands. Epigastric, ventral (almost full), and inframammillary sclerites orange-brown. First pair of abdominal setae moderately thin and long, second moderately thick and long.

Sternum very elongated, brown-black, with very long thin hairs.

Chelicerae dark red-brown, with two moderately small retromargin teeth and three promargin teeth—the median larger, the proximal the same size, and the distal (medial and distal to the median promargin

tooth) much smaller than the retromargin teeth.

Coxae I and II brilliant white, III and IV maroon-brown. Trochanter IV notch extremely small.

Femur I with dark brown basal half, apical half white with a wide dorsal and a pair of ventral brown stripes extending from basal section; femora II, III, and IV maroon-brown. Rest of legs I and II—patellae-tibiae yellow, with a pair of dorsal-lateral red-brown stripes (and patella-tibia I completely red-brown distally), metatarsi red-brown proximally and yellow-brown distally, yellow-brown tarsi (leg II somewhat darker); rest of legs III and IV brown-black, with proximal half of patella yellow-white and tarsi orange-brown. Legs moderately hirsute. Heavy hairs on tibiae III and IV, as in female. Tibia I ventral spination: 3-3, moderately long and thin.

Pedipalp with no tibial apophysis. Tarsus with a globose genital bulb drawn out into a thick neck with a small pointed embolus at the end of a large spiral twist (Figs. 262, 263).

FEMALE

Measurements. Based on 3 females: carapace length 5.25-5.75 mm; carapace width 2.05-2.20 mm; carapace index 38-39; sternum length 2.55-2.65 mm; sternum width 1.05 mm; sternum index 39-41.

Femur IV length 4.50-5.25 mm; femur IV width 0.60-0.70 mm; leg thickness index 13-14; leg length index 86-91.

Abdomen length 3.05-4.05 mm; abdomen width 2.15-3.55 mm; abdomen index 69-87; dorsal sclerite length 1.15-1.40 mm; dorsal sclerite width 1.05-1.15 mm; dorsal sclerite index 79-92.

Description. A large spider. Carapace long and narrow, dark orange-brown (darker in thoracic section), with a weak horizontal impression between the cephalic and thoracic regions, and covered with low hairs—white hair on posterior side of the

impression, a band of black hairs just behind the white, off to the sides, and a longitudinal band of erect black hairs down back of thoracic region. Eyes small and equal, except anterior median eyes about twice the diameter of anterior lateral eyes. Both rows of eyes recurved, the posterior row about one-third wider than anterior row. Thoracic groove absent. Cephalic region narrower than thoracic region (cephalic width index 81–87).

Abdomen a short oval, pointed posteriorly, with a moderately small, red-brown dorsal sclerite, and covered with long, silver hairs with three dark, thin, horizontal bands, the anterior one incomplete. Epigastric and small inframammillary sclerites yellow-brown. Ventrums greyish brown, with a pair of light stripes from each side of epigastric furrow to region of posterior sclerite. First pair of abdominal setae thin, second pair moderate and long.

Sternum very elongated, brown-black, with very long, thin hairs.

Chelicerae red-brown, with two moderately small retromargin teeth and three promargin teeth—the median larger, the proximal the same size, and the distal (medial and distal to the median promargin tooth) much smaller than the retromargin teeth.

Coxae I and II brilliant white; III and IV brown-black. Only a trace of a trochanter IV notch.

Femur I with a brown-black basal half, apical half white with a wide dorsal and a pair of ventral brown-black stripes extending from basal section; femora II, III, and IV brown-black. Rest of legs I and II—patellae-tibiae yellow, with a pair of dorsal-lateral red-brown stripes (and patella-tibia I completely red-brown distally), metatarsi red-brown proximally and yellow-brown distally, yellow-brown tarsi (leg II somewhat darker); rest of legs III and IV brown-black, with proximal half of patella yellow-white and tarsi orange-brown. Legs moderately hirsute. Tibiae III and IV

heavily hirsute, with heavy hairs, especially on dorsal sides. These hairs increase the apparent width of the distal end of tibia IV from 0.46 mm to 0.73 mm. Tibia I ventral spination: 3–3, very long and thin.

External epigynum with a horizontal, sclerotized lip and two lateral openings (Fig. 265). Internal structure with large, moderately globose spermathecae having wide necks and direct, moderate bursae copulatrices (Fig. 264).

Diagnosis. *Myrmecotypus rettenmeyeri* differs from all other *Myrmecotypus* in its large size and in the longitudinal row of dense hairs on the posterior of the thoracic region.

Remarks. The large size, thin legs, and strange hair growth on the carapace are the result of strong selection for a mimetic resemblance to *Camponotus sericeiventris* (Guérin). The female genitalia are similar to those of *M. niger*, but the male genitalia are very distinct, with the looping of the palpal duct more like that of the *olympus* group.

Natural history. This species mimics *Camponotus sericeiventris* and is found in the same habitat as that ant on Barro Colorado Island (Reiskind, 1966).

Distribution. Panama (Map 14).

Records. CANAL ZONE. Barro Colorado Island, Forest Reserve.

THE PILOSUS GROUP

Myrmecotypus pilosus (O. P.-Cambridge) Figures 245–248. Map 14.

Corinnomma pilosa O. P.-Cambridge, 1898, Biol. Centrali-Americana Arachnida 1:277–278, pl. 33, figs. 3, 4, ♂, ♀. Female holotype from Teapa, Tabasco, Mexico; in the British Museum (Natural History), examined.

Myrmecotypus pilosus: F. P.-Cambridge, 1894, Biol. Centrali-Americana Arachnida 2:84.

Myrmecotypus obscurus Chickering, 1937, Trans. Amer. Microscop. Soc. 56(1):37–38, figs. 18, 43, 80, ♂, ♀. Male holotype from Barro Colorado Island, Panama Canal Zone; in the Museum of Comparative Zoology, examined. NEW SYNONYMY.

MALE

Measurements. Based on 10 males: carapace length 2.30–2.60 mm; carapace width 1.20–1.30 mm; carapace index 51–53; sternum length 1.05–1.15 mm; sternum width 0.60–0.70 mm; sternum index 58–69.

Femur IV length 1.65–1.75 mm; femur IV width 0.30–0.40 mm; leg thickness index 20–23; leg length index 65–72.

Abdomen length 2.05–2.40 mm; abdomen width 1.35–1.55 mm; abdomen index 64–68.

Embolus length 0.12–0.15 mm; bulb length 0.65–0.73 mm; male genital index 17–20.

Description. Carapace orange-brown, with a shallow impression between the cephalic and thoracic regions, and covered with moderately light white hairs, with some black hairs in the impression. Eyes small and equal, except the anterior median eyes twice the diameter of the anterior laterals, both rows recurved when viewed dorsally, the posterior row one-third wider than the anterior row. Carapace somewhat narrowed in head region (cephalic width index 65–72) and squarely truncated anteriorly. Thoracic groove absent.

Abdomen wide oval, with a full, red-brown dorsal sclerite covered with short white hairs and long erect hairs and with two horizontal bands of golden-brown hairs. Yellow-brown epigastric, ventral (almost full), and inframammillary (small) sclerites. Abdominal setae extremely long—first pair thin, second pair moderate.

Sternum reddish brown, elongate, with long, light hairs.

Chelicerae yellow-brown, with two moderate retromargin teeth and three promargin teeth, the median one larger, the proximal one smaller, and the distal one much smaller than the retromargin teeth.

Coxa I light brown, II creamy white, III and IV yellow-brown. Trochanter IV notch absent.

Femur I yellow-white, with light brown stripes (dorsal and ventral) and base; femur

II yellow-white, light brown on sides; femora III and IV light red-brown. Rest of I and II yellow-white—patellae-tibiae and metatarsi with red-brown sides (metatarsus I all red-brown); rest of III and IV light reddish brown (lightening distally to light orange-brown tarsi). Legs moderately lightly hirsute. Tibia I ventral spination: 3–3, moderately short and thin.

Pedipalp with no tibial apophysis. Tarsus with a globose genital bulb drawn out into a neck with a strong, spiral, simple embolus (Fig. 248). Bulb with an embolus palpal duct and a single loop in the basal globe (Fig. 247).

FEMALE

Measurements. Based on holotype and 8 females, holotype listed first, range of all follows: carapace length 2.95 mm, 2.50–2.95 mm; carapace width 1.50 mm, 1.30–1.50 mm; carapace index 50, 50–53; sternum length 1.30 mm, 1.10–1.30 mm; sternum width 0.75 mm, 0.65–0.75 mm; sternum index 56, 56–63.

Femur IV length 1.95 mm, 1.75–1.95 mm; femur IV width 0.40 mm, 0.35–0.40 mm; leg thickness index 22, 19–22; leg length index 65, 65–72.

Abdomen length 2.95 mm, 2.25–2.95 mm; abdomen width 2.20 mm, 1.75–2.40 mm; abdomen index 76, 72–90. Based on 8 females only, type measurements not included: dorsal sclerite length 1.45–1.90 mm; dorsal sclerite width 1.75–2.05 mm; dorsal sclerite index 97–127.

Description. Carapace dark red-brown, with a shallow impression between the cephalic and thoracic regions, covered with moderately light, white hairs. Eyes small and equal, except the anterior median eyes twice the diameter of anterior laterals, both rows recurved when viewed dorsally, the posterior row about one-fourth wider than the anterior row. Carapace somewhat narrowed in head region (cephalic width index 67–74) and squarely truncated anteriorly. Thoracic groove absent.

Abdomen a large oval, with a large, dark red-brown dorsal sclerite (about three-fifths length of abdomen), thick, low, white hairs and long, thin, erect hairs (more numerous on posterior half). A horizontal golden brown hair band on sclerite (broken in middle). Deep red-brown epigastric and small inframamillary sclerites. Ventrums dull brown. Abdominal setae extremely long—first pair thin, second pair moderate.

Sternum dark red-brown, elongate, with long, light hairs.

Chelicerae red-brown, with two moderate retromargin teeth and three promargin teeth, the median one larger, the proximal one smaller, and the distal one much smaller than the retromargin teeth.

Coxa I light yellow-brown, II yellow-white, III dark yellow-brown, IV dark red-brown. Trochanter IV notch absent.

Femur I light yellow, with dark red-brown dorsal stripe and prolateral base; femur II light yellow-brown, with light red-brown sides; femora III and IV red-brown. Rest of legs I and II yellow, patellae-tibiae and metatarsi with red-brown sides, orange tarsi; rest of legs III and IV reddish brown, lighter tarsi. Legs moderately lightly hirsute. Tibia I ventral spination: 3–3, long and moderately thin.

External epigynum a wide slit (Fig. 245). Internal structure with two small, globose spermathecae with very short, small posterior necks (Fig. 246).

Diagnosis. *Myrmecotypus pilosus* differs from other *Myrmecotypus* species in its narrower cephalic region (cephalic width index 64–74) and distinctive genitalia.

Remarks. The male genitalia is very different from the genitalia of any other New World species of Castianeirinae and suggests a possible relationship with some Old World groups, e.g., *Corinnomma*, because of the single lateral loop in the globe of the genital bulb.

Natural history. O. P.-Cambridge (1898) quotes observations of the collector of the type specimen: "Female in a leaf, in thick

woods near a stream; it was sitting on the point of the leaf with the front legs extended. A black ant resembling this spider is common in the same woods. According to my observations, these ant-like spiders eat only the species of ant which they resemble. A specimen of this spider was found in a shady glen." No other ant-mimicking clubionid has been observed eating ants, and this report should be confirmed.

Distribution. Mexico, Panama (Map 14).

Records. MEXICO. *Tabasco, Veracruz.* PANAMA. El Valle.

CANAL ZONE. Barro Colorado Island, Experimental Gardens, Madden Dam.

Sphecotypus O. P.-Cambridge

Sphecotypus O. P.-Cambridge, 1895, *Biol. Centrali-Americana Arachnida* 1:152–153, pl. 19, fig. 4, ♀. Type species by monotypy: *Sphecotypus niger* (Perty).

Sphecotypus niger (Perty) Figure 290.

Myrmecia nigra Perty, 1833, *Delectus Animalium* (ed. J. B. de Spix and F. P. Martius). Monachii, 1833:199, Pl. 39, Fig. 9, ♀, from Sebastianopolin (Rio de Janeiro), Brazil. C. L. Koch, 1842, *Die Arachniden* 9:15–17, ♀, Fig. 701.

Myrmecia niger: Keyserling, 1891, *Spinn. Amer.* 3 (Bras. Spinn.):80, pl. 2, fig. 40, ♀.

Sphecotypus formicarius O. P.-Cambridge, 1895, *Biol. Centrali-Americana Arachnida* 1:153, pl. 19, fig. 4, ♀, from Bugaba in Chiriqui, Panama; in the British Museum (Natural History).

Sphecotypus niger: Simon, 1897, *Histoire Naturelle des Araignées* 2(1):176, figs. 168, 169, 171, ♀. F. P.-Cambridge, 1899, *Biol. Centrali-Americana Arachnida* 2:84.

Diagnosis. *Sphecotypus* differs from all other Castianeirinae in its elongated carapace, constricted between the cephalic and thoracic regions with no further constrictions in the thoracic region (as in *Myrmecium*) (Fig. 290).

Remarks. This South American genus is monotypic, with its one species occurring in Panama. Proper classification of this species should await a study of the South American fauna, and therefore is only briefly noted here.

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Plate I

Figs. 7-10. *Castianeira longipalpus* (Hentz). 7, Internal epigynum, dorsal view. 8, External epigynum. 9, Left palpus. 10, Embalus.

Figs. 11-14. *Castianeira luctifera* Petrunkevitch. 11, Internal epigynum, dorsal view. 12, External epigynum. 13, Left palpus. 14, Embalus.

Figs. 15-18. *Castianeira alata* Muma. 15, Internal epigynum, dorsal view. 16, External epigynum. 17, Left palpus. 18, Embalus.

(Scale line for epigyna and palpi = 0.59 mm; for embali = 0.15 mm.)

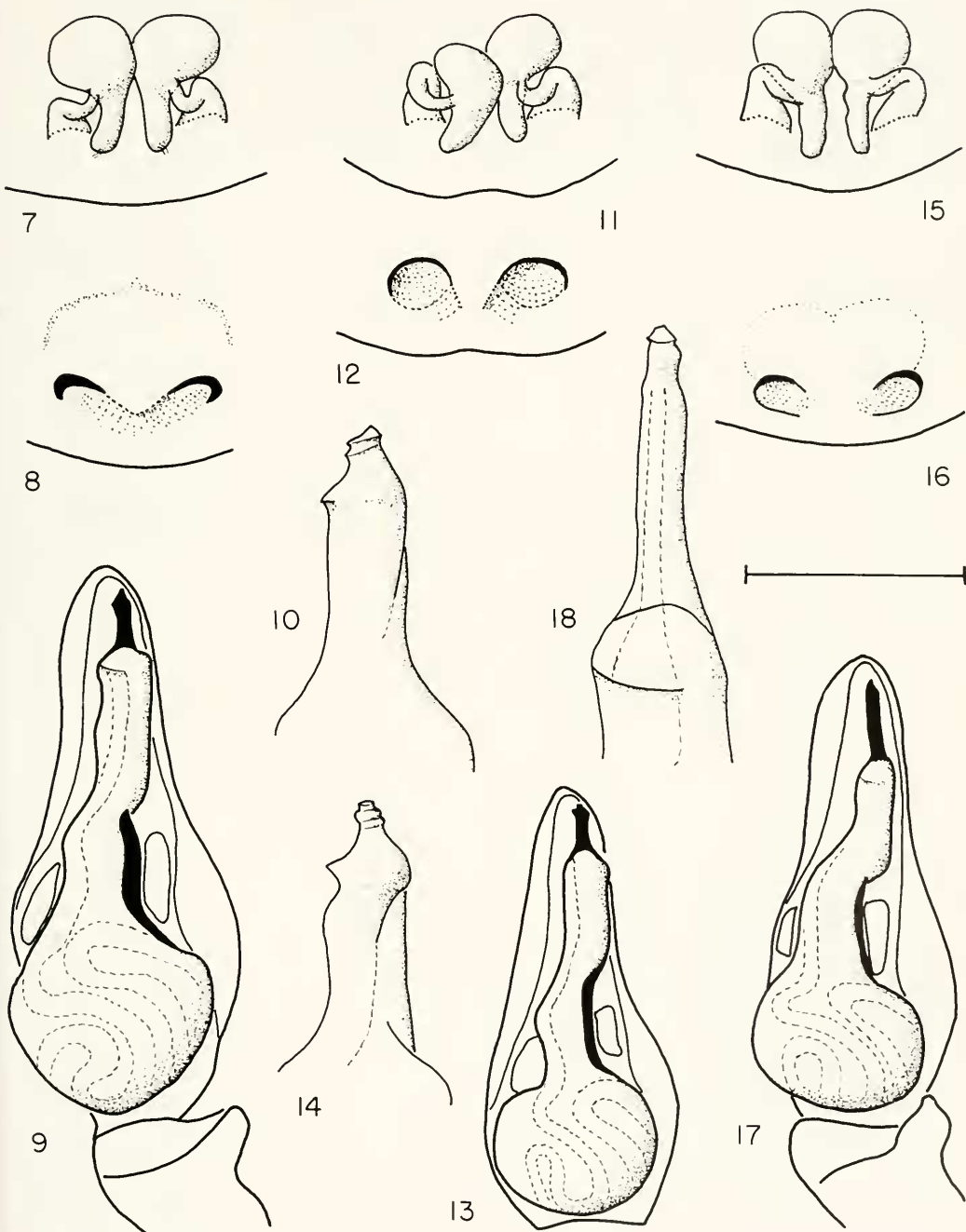


Plate II

Figs. 19–23. *Castianeira variata* Gertsch. 19, Internal epigynum, dorsal view (Louisiana). 20, External epigynum (Louisiana). 21, Internal epigynum, dorsal view (Arkansas). 22, Left palpus. 23, Embolus.

Figs. 24–27. *Castianeira plarans* (O. P.-Cambridge). 24, External epigynum. 25, Internal epigynum, dorsal view. 26, Left palpus. 27, Embolus.

Figs. 28–31. *Castianeira thalia* n. sp. 28, Internal epigynum, dorsal view. 29, External epigynum. 30, Left palpus. 31, Embolus.

(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

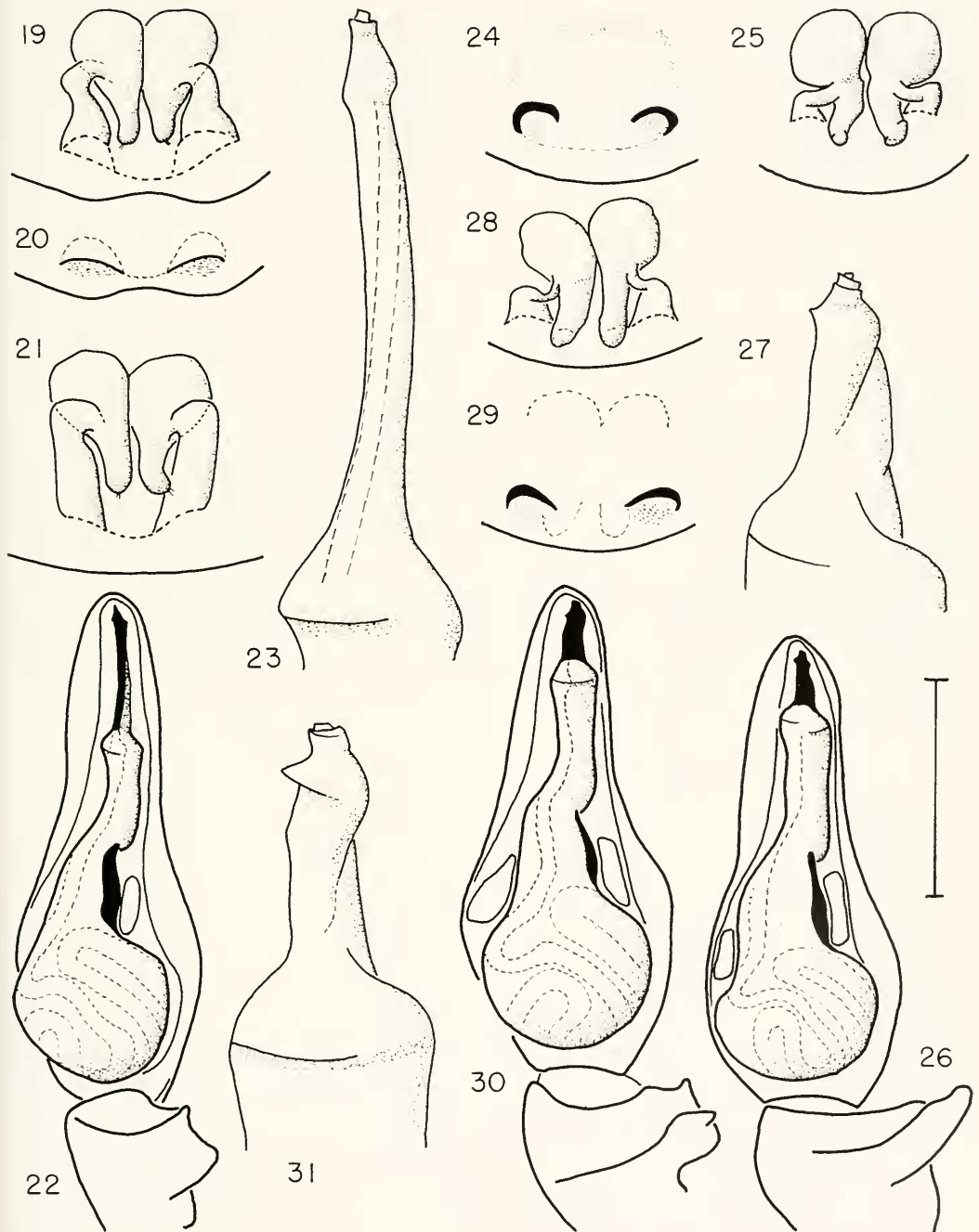


Plate III

Figs. 32, 33. *Castianeira mexicana* (Banks). 32, Internal epigynum, dorsal view. 33, External epigynum.

Figs. 34, 35. *Castianeira lachrymasa* (O. P.-Cambridge). 34, Epigynum, ventral view cleared. 35, External epigynum.

Figs. 36, 37. *Castianeira venusta* (Banks). 36, Epigynum, ventral view cleared. 37, External epigynum.

Figs. 38, 39. *Castianeira flebilis* O. P.-Cambridge. 38, Internal epigynum, dorsal view. 39, External epigynum.

Figs. 40-43. *Castianeira floridana* (Banks). 40, Internal epigynum, dorsal view. 41, External epigynum. 42, Left palpus. 43, Embolus.

Figs. 44, 45. *Castianeira crocata* (Hentz). 44, External epigynum. 45, Internal epigynum, dorsal view.

Figs. 46-49. *Castianeira vulnerea* Gertsch. 46, External epigynum. 47, Internal epigynum, dorsal view. 48, Left palpus. 49, Embolus.

(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

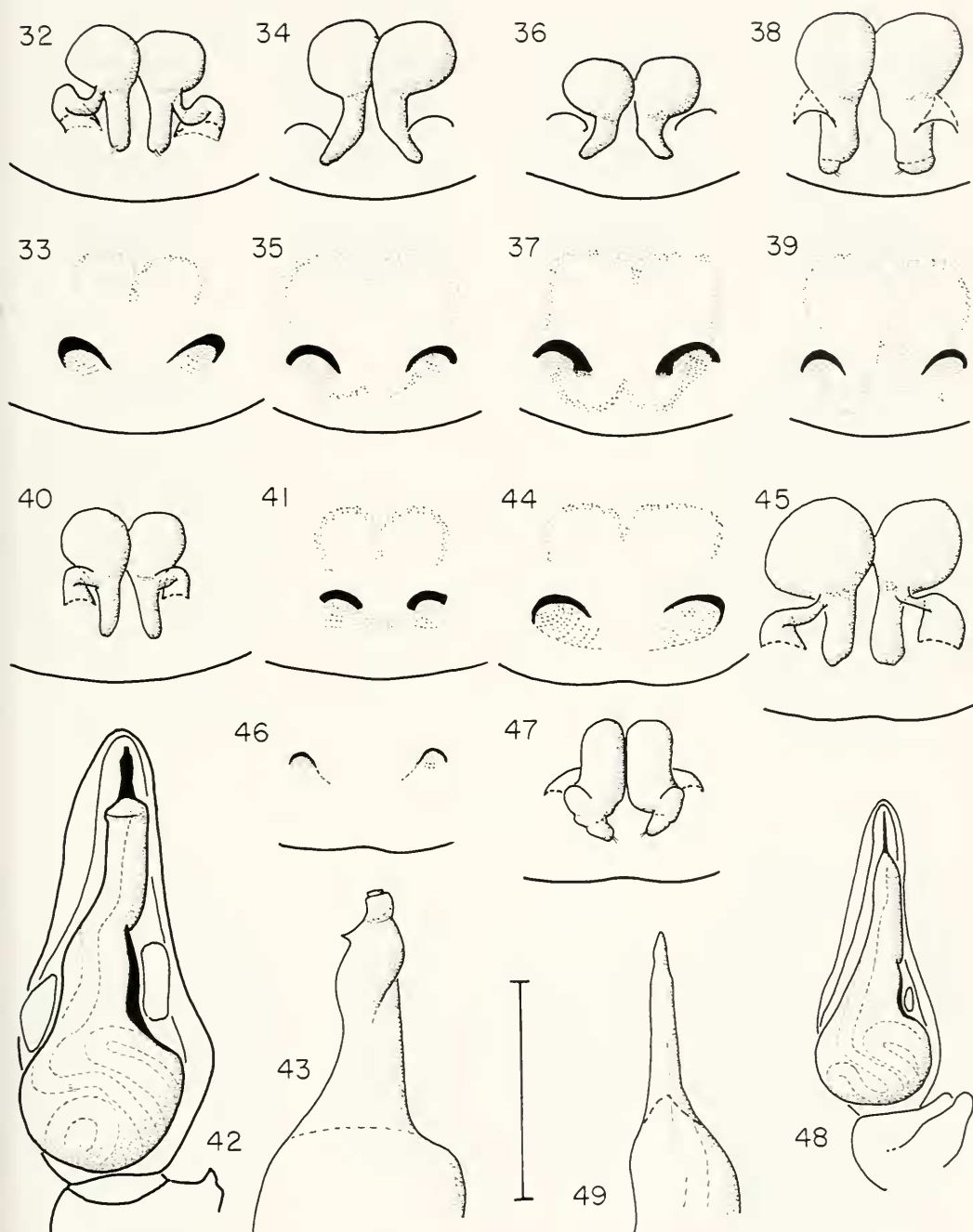


Plate IV

Figs. 50-53. *Castianeira longipalpus* (Hentz). 50, Male abdomen. 51, Female abdomen. 52, Eye region of female. 53, Female carapace.

Figs. 54, 55. *Castianeira luctifera* Petrunkevitch. 54, Female abdomen. 55, Male abdomen.

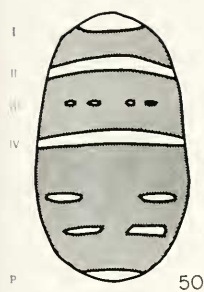
Fig. 56. *Castianeira cracata* (Hentz). Female abdomen.

Fig. 57. *Castianeira venusta* (Banks). Female abdomen.

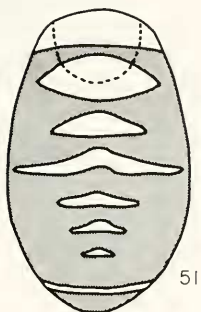
Figs. 58, 59. *Castianeira floridana* (Banks). 58, Female abdomen. 59, Male abdomen.

Figs. 60, 61. *Castianeira variata* Gertsch. 60, Male abdomen. 61, Female abdomen.

(Scale line for abdomens and carapaces = 2.72 mm; for eye region = 0.94 mm.)



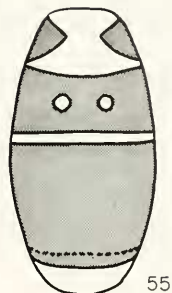
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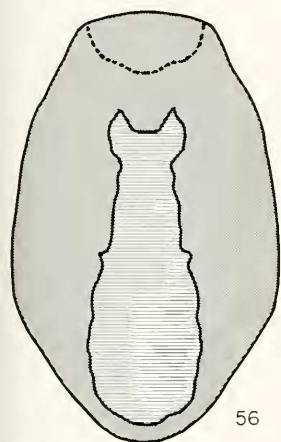
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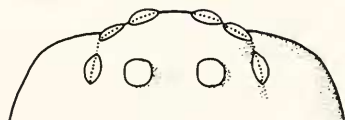
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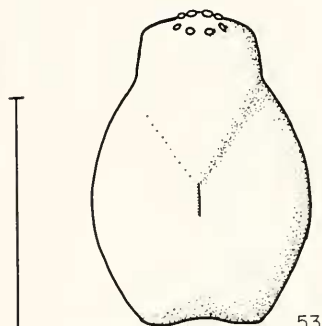
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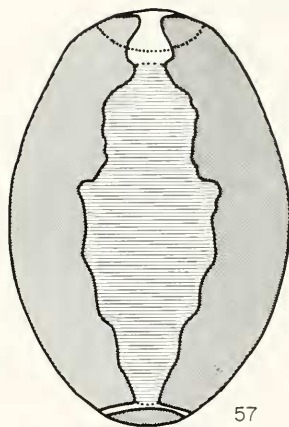
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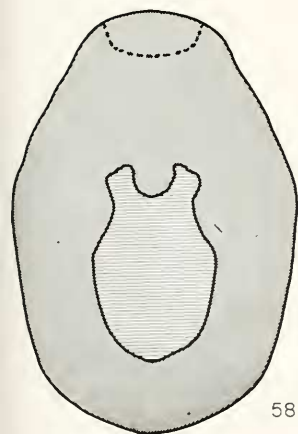
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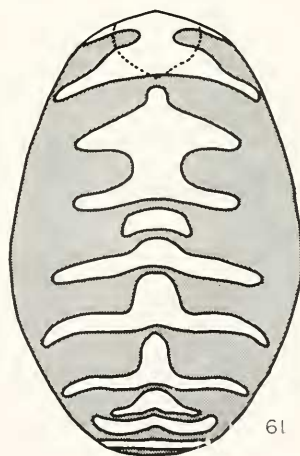
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61

Plate V

Figs. 62-65. *Castianeira crucigera* (Hentz). 62, Internal epigynum, dorsal view. 63, External epigynum. 64, Left palpus. 65, Embolus.

Figs. 66-69. *Castianeira alteranda* Gertsch. 66, External epigynum. 67, Internal epigynum, dorsal view. 68, Left palpus. 69, Embolus.

Figs. 70-73. *Castianeira amaena* (C. L. Kach). 70, Internal epigynum, dorsal view. 71, External epigynum. 72, Left palpus. 73, Embolus.

(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

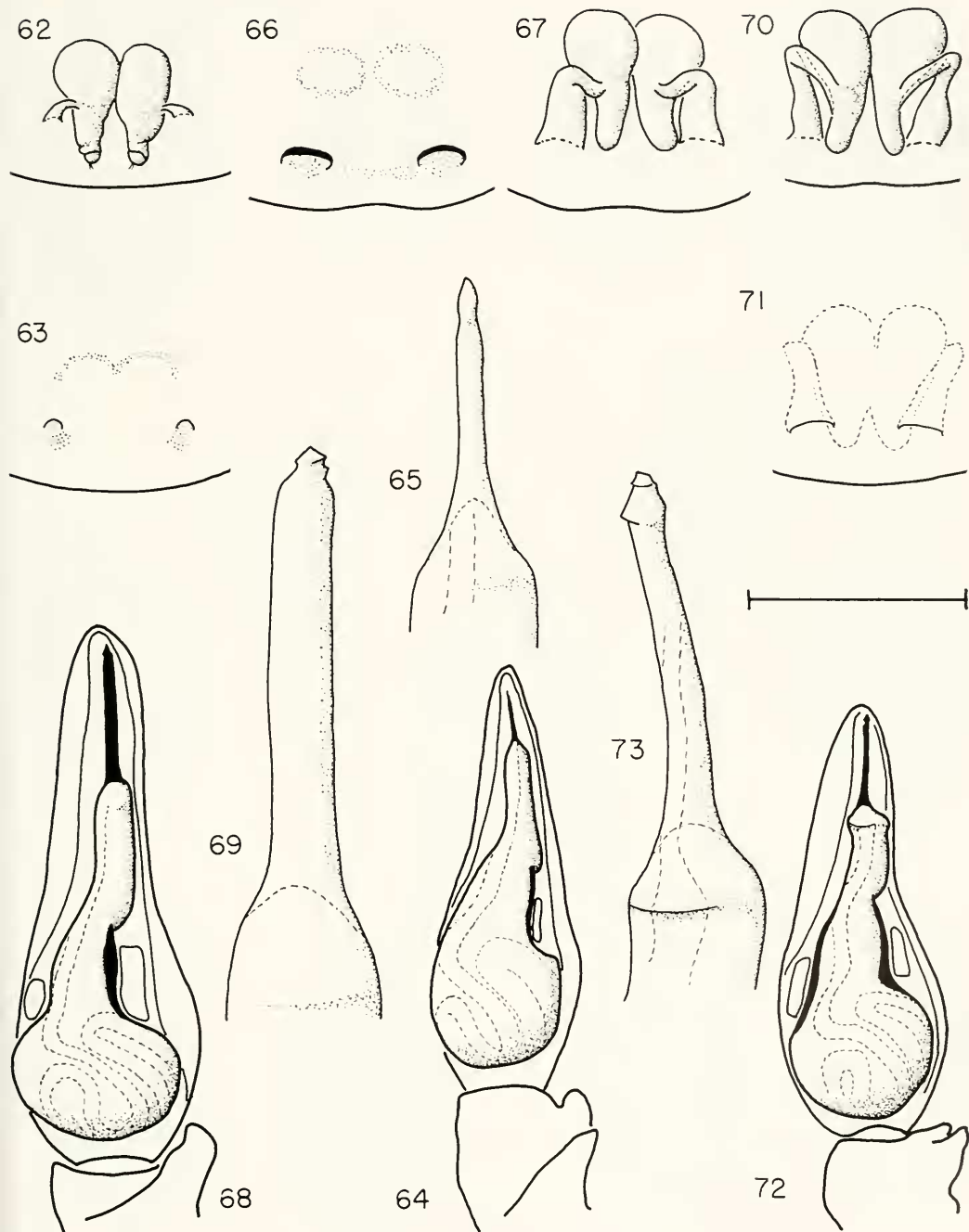


Plate VI

Fig. 74. *Castianeira flebilis* O. P.-Cambridge. Female abdomen.

Figs. 75, 76. *Castianeira thalia* n. sp. 75, Female abdomen. 76, Male abdomen.

Fig. 77. *Castianeira lachrymasa* (O. P.-Cambridge). Female abdomen.

Fig. 78. *Castianeira variata* Gertsch. Male abdomen.

Fig. 79. *Castianeira plarans* (O. P.-Cambridge). Left chelicera, ventral view.

Fig. 80. *Castianeira alata* Muma. Male abdomen.

Fig. 81. *Castianeira vulnerea* Gertsch. Female abdomen.

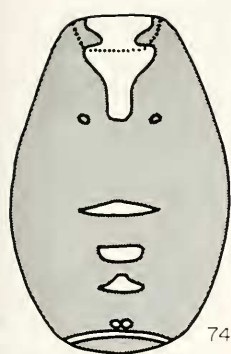
Fig. 82. *Castianeira mexicana* (Banks). Female abdomen.

Fig. 83. *Castianeira alteranda* Gertsch. Female abdomen.

Figs. 84, 85. *Castianeira amaena* (C. L. Koch). 84, Female abdomen. 85, Male abdomen.

Figs. 86, 87. *Castianeira crucigera* (Hentz). 86, Male abdomen. 87, Female abdomen.

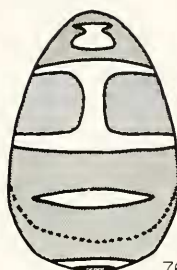
(Scale line for abdomens = 2.72 mm; for chelicera = 0.94 mm.)



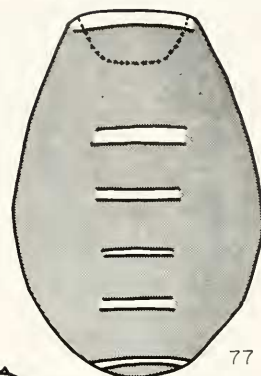
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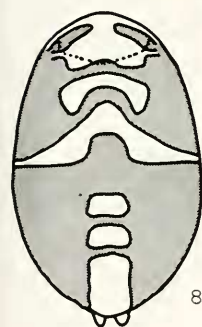
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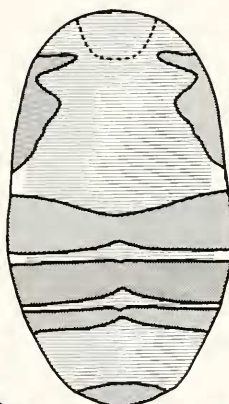
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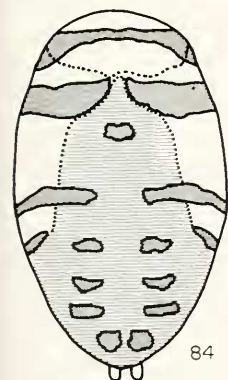
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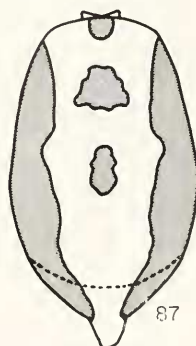
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Plate VII

Figs. 88-91. *Castianeira descripta* (Hentz). 88, Internal epigynum, dorsal view. 89, External epigynum. 90, Left palpus. 91, Embolus.

Figs. 92-95. *Castianeira walsinghamsi* (O. P.-Cambridge). 92, Internal epigynum, dorsal view. 93, External epigynum. 94, Left palpus. 95, Embolus.

Figs. 96-99. *Castianeira occidens* n. sp. 96, Internal epigynum, dorsal view. 97, External epigynum. 98, Left palpus. 99, Embolus.

(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

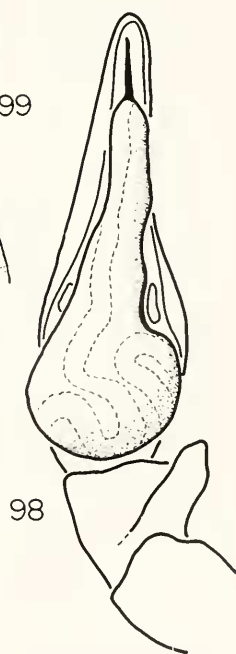
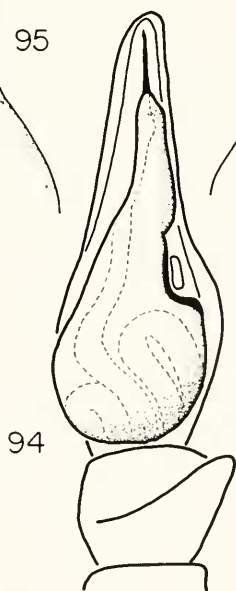
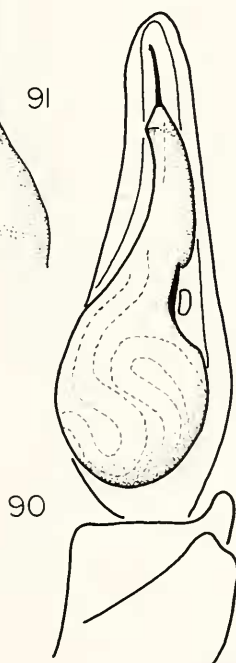
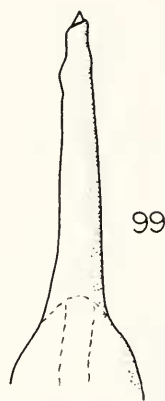
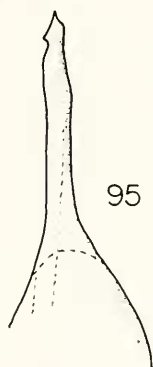
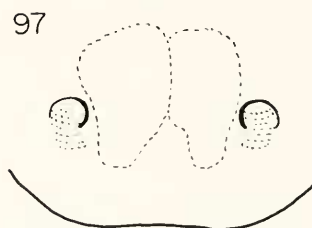
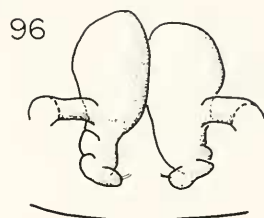
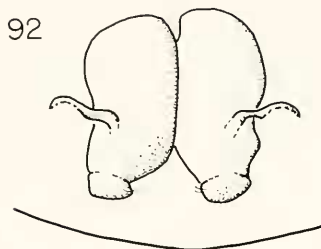
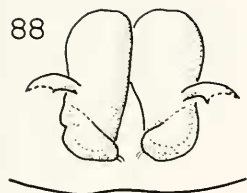


Plate VIII

Figs. 100–103. *Castianeira cingulata* (C. L. Koch). 100, Internal epigynum, dorsal view. 101, External epigynum. 102, Left palpus. 103, Embolus.

Figs. 104–107. *Castianeira gertschi* Kaston. 104, Internal epigynum, dorsal view. 105, External epigynum. 106, Left palpus. 107, Embolus.

Figs. 108–110. *Castianeira trilineata* (Hentz). 108, Internal epigynum, dorsal view. 109, External epigynum. 110, Left palpus.

Figs. 111, 112. *Myrmecatypus lineatus* (Emerton). 111, Internal epigynum, dorsal view. 112, External epigynum.

(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

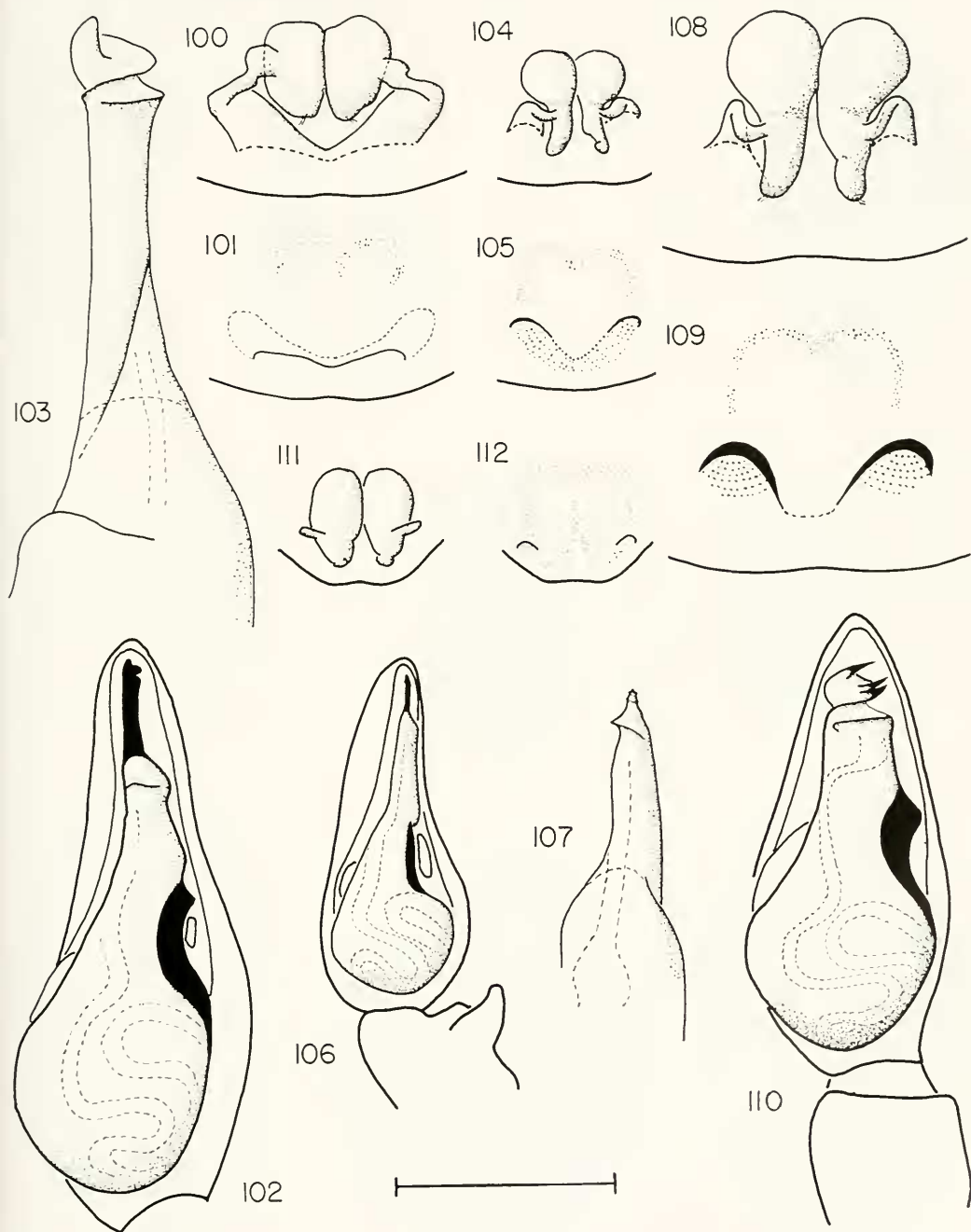


Plate IX

Figs. 113–115. *Castianeira occidentis* n. sp. 113, Male abdomen. 114, Carapace of female. 115, Female abdomen.

Figs. 116–118. *Castianeira cingulata* (C. L. Koch). 116, Male carapace. 117, Male abdomen. 118, Female abdomen.

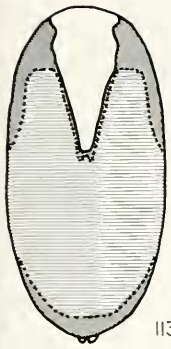
Fig. 119. *Castianeira trilineata* (Hentz). Male abdomen (Tennessee).

Fig. 120. *Castianeira gertschi* Kaston. Male abdomen.

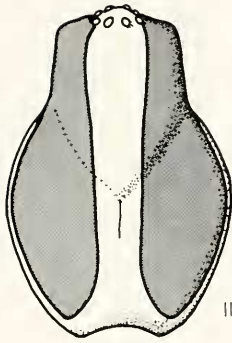
Fig. 121. *Castianeira descripta* (Hentz). Female abdomen.

Fig. 122. *Castianeira walsinghami* (O. P.-Cambridge). Female abdomen.

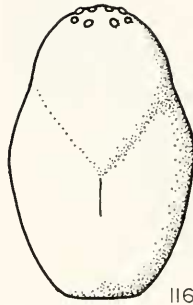
(Scale line for abdomens and carapace = 2.72 mm.)



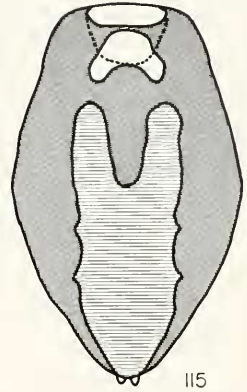
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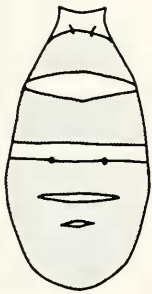
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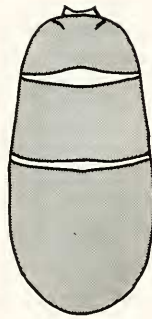
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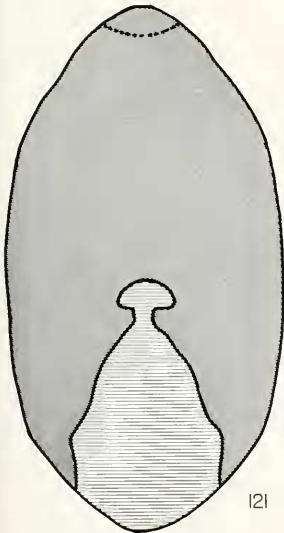
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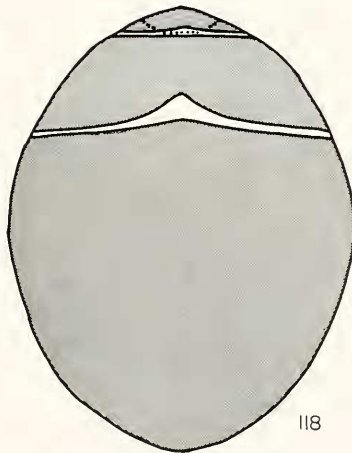
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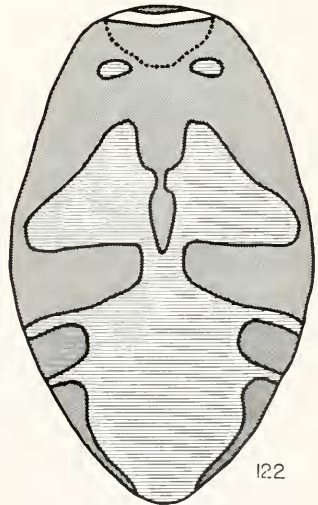
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Plate X

Figs. 123–126. *Castianeira alfa* n. sp. 123, Internal epigynum, dorsal view. 124, External epigynum. 125, Left palpus. 126, Embolus.

Figs. 127, 128. *Castianeira dugesii* (Becker). 127, Left palpus. 128, Embolus.

Figs. 129–132. *Castianeira nanella* Gertsch. 129, Internal epigynum, dorsal view. 130, External epigynum. 131, Left palpus. 132, Embolus.

Figs. 133–136. *Castianeira darsata* (Banks). 133, Internal epigynum, dorsal view. 134, Embolus. 135, Left palpus. 136, External epigynum.

(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

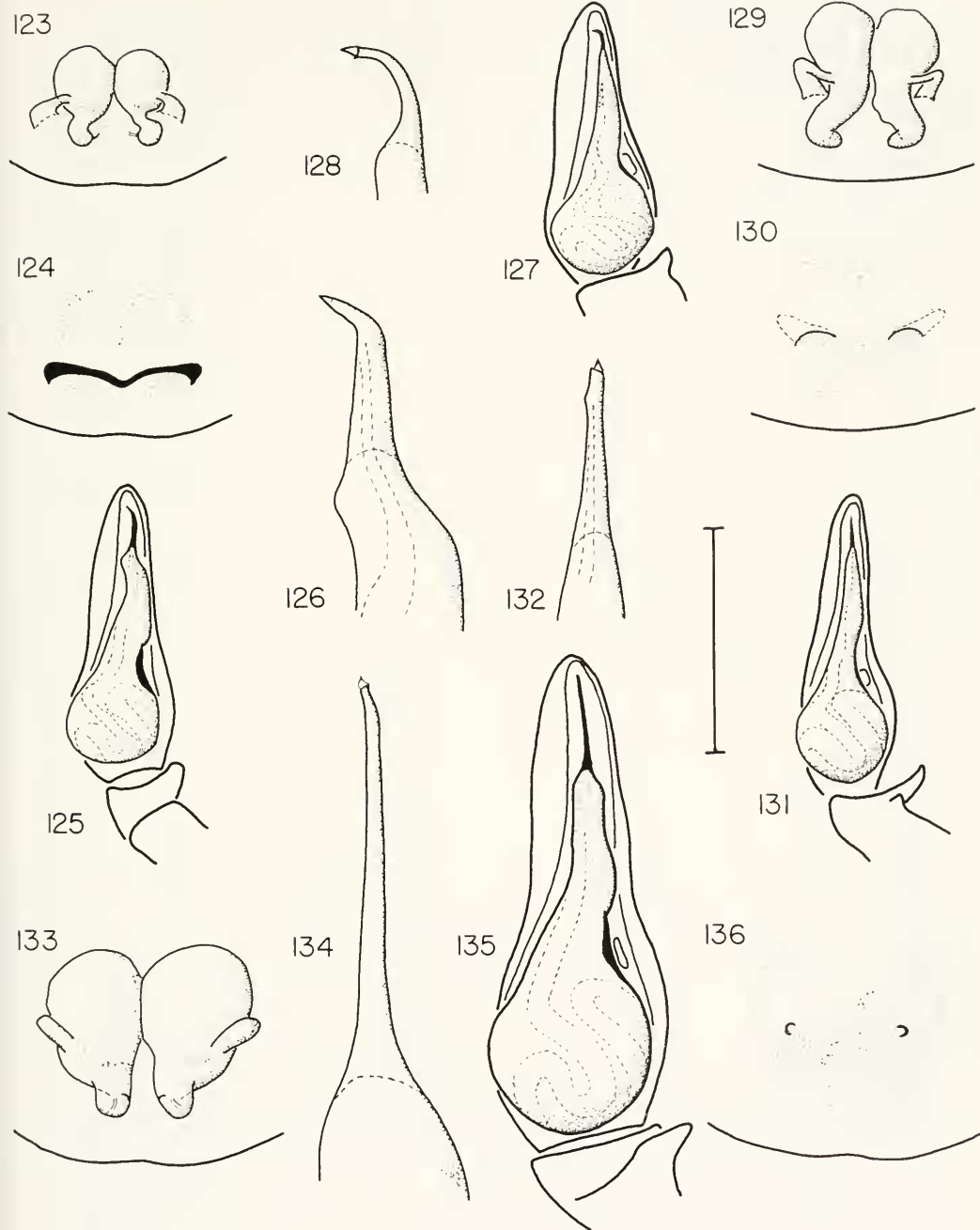


Plate XI

Figs. 137-141. *Castianeira azteca* n. sp. 137, Internal epigynum, dorsal view. 138, External epigynum. 139, Left palpus. 140, Embolus. 141, Tip of embolus.

Fig. 142. *Castianeira luctuosa* O. P.-Cambridge. Epigynum, ventral view cleared.

Figs. 143, 144. *Castianeira alba* n. sp. 143, Left palpus. 144, Embolus.

Figs. 145-147. *Castianeira stylifera* Kraus. 145, Internal epigynum, dorsal view. 146, External epigynum. 147, Left palpus.

(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

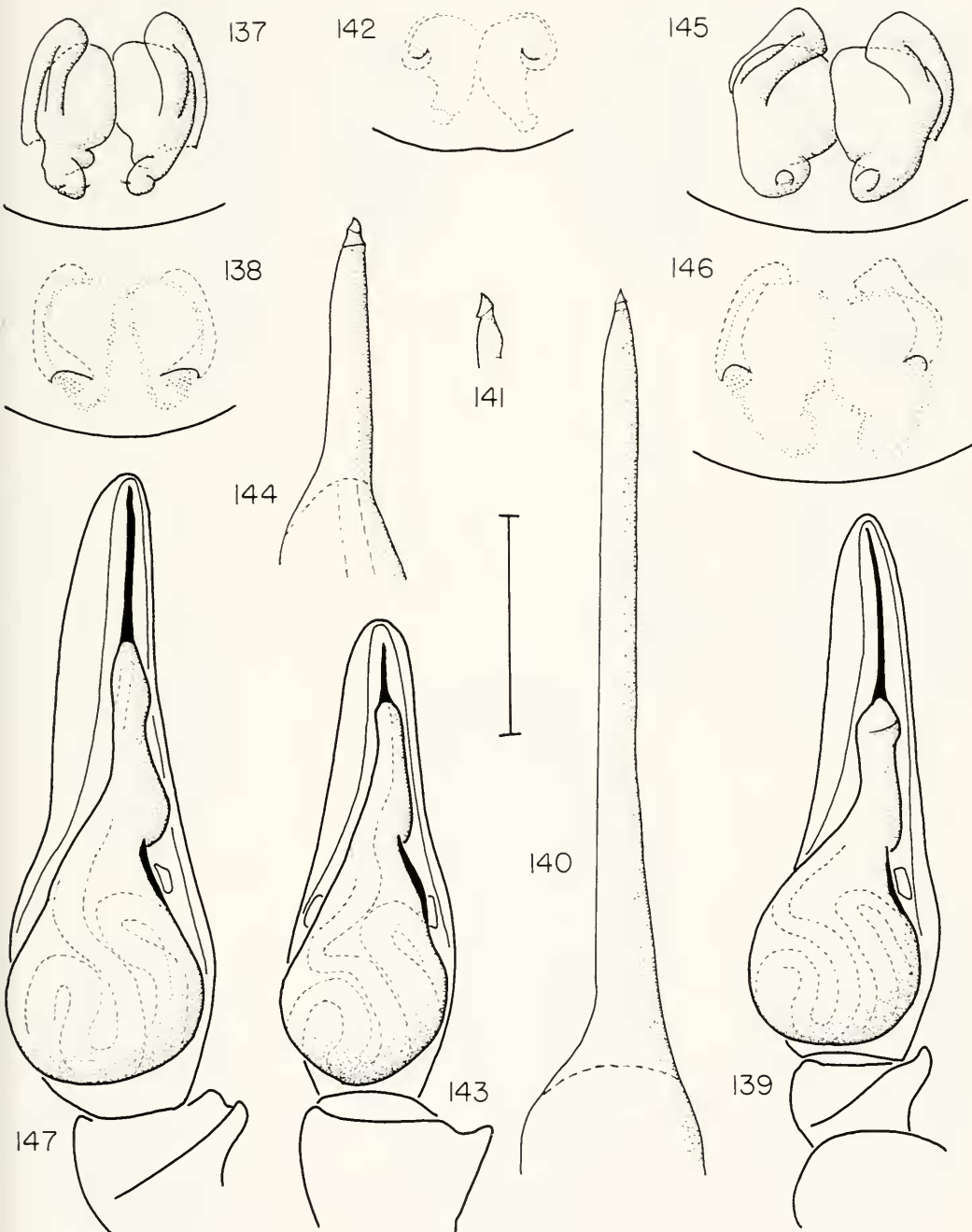


Plate XII

Fig. 148. *Castianeira dorsata* (Banks). Female abdomen.

Figs. 149, 150. *Castianeira nanella* Gertsch. 149, Male abdomen. 150, Female abdomen.

Fig. 151. *Castianeira alfa* n. sp. Female abdomen.

Fig. 152. *Castianeira luctuosa* O. P.-Cambridge. Female abdomen.

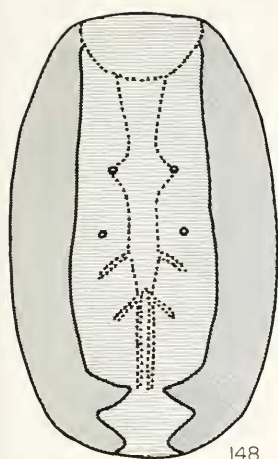
Figs. 153-155. *Myrmecatypus lineatus* (Emerton). 153, Eye region of female. 154, Female carapace. 155, Female abdomen.

Fig. 156. *Castianeira azteca* n. sp. Female abdomen.

Figs. 157, 158. *Castianeira alba* n. sp. 157, Male abdomen. 158, Female abdomen.

Fig. 159. *Castianeira styliifera* Kraus. Female abdomen.

(Scale line for abdomens and carapaces = 2.72 mm; for eye region = 0.94 mm.)



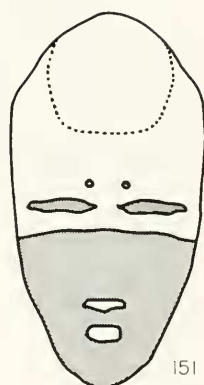
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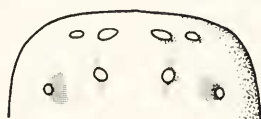
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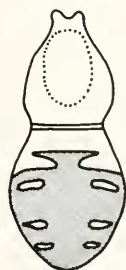
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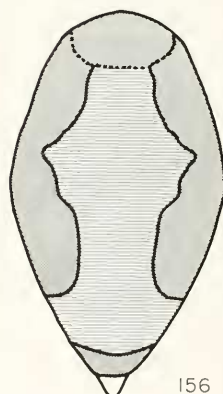
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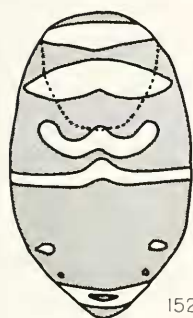
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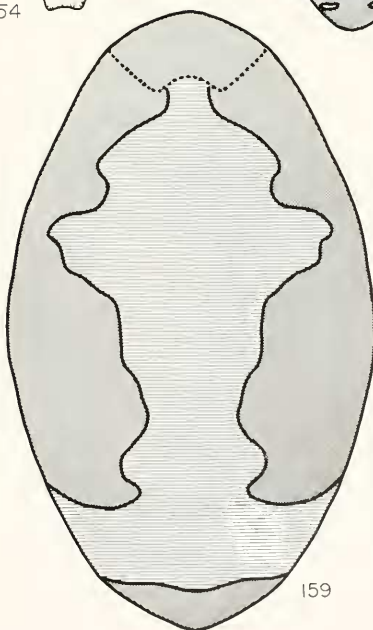
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(Scale line for epigyno and polpi = 0.59 mm; for emboli = 0.15 mm.)

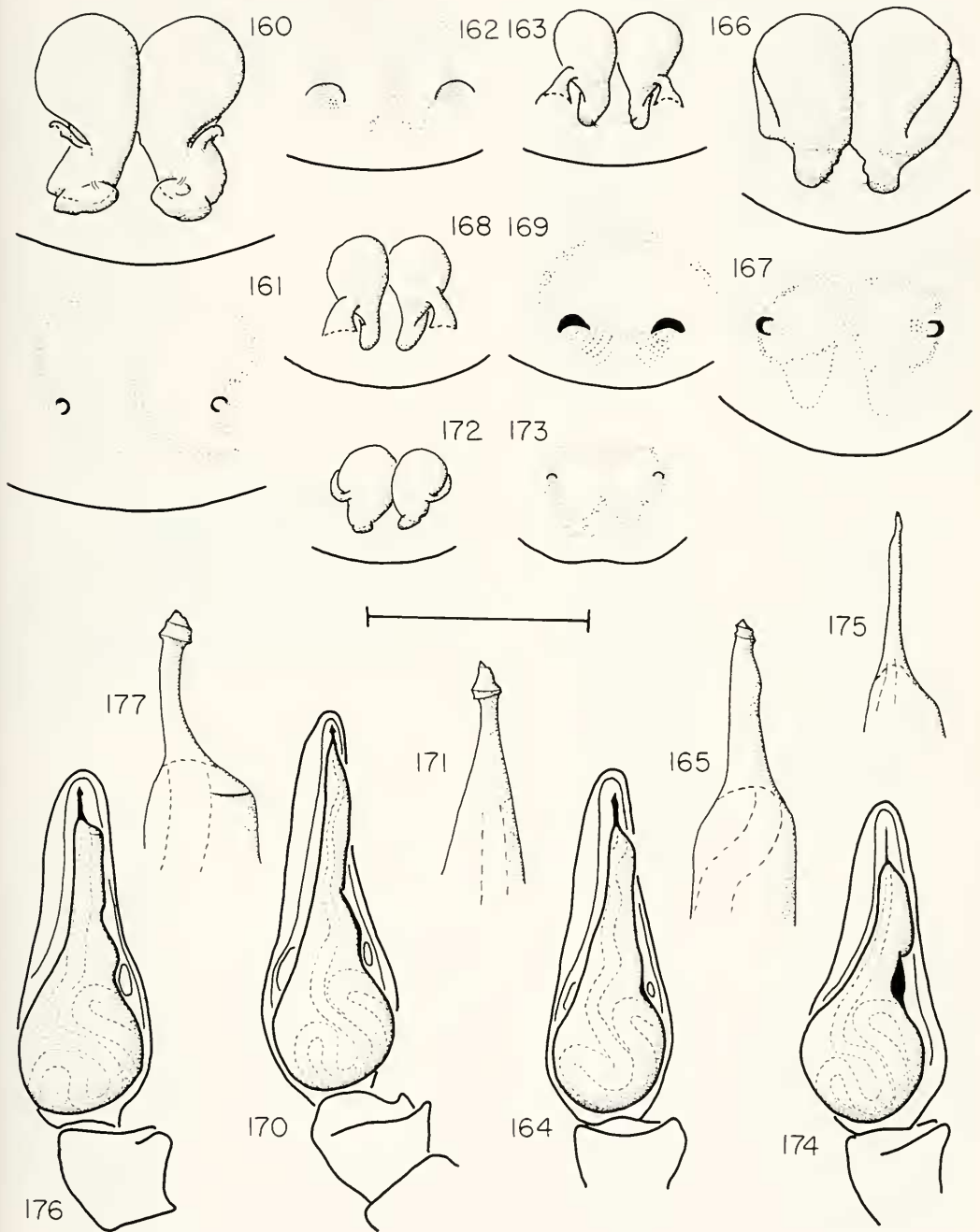


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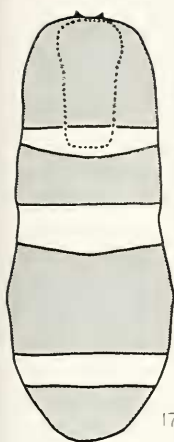
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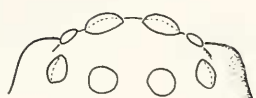
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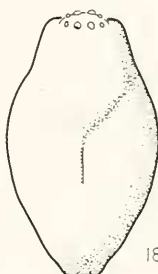
(Scale line for abdomens and carapaces = 2.72 mm; for eye region = 0.94 mm.)



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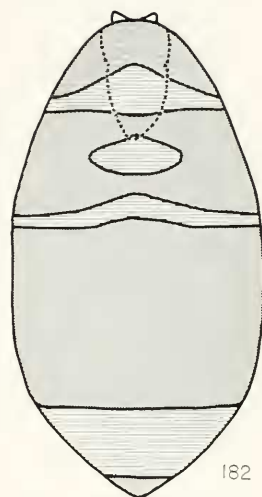
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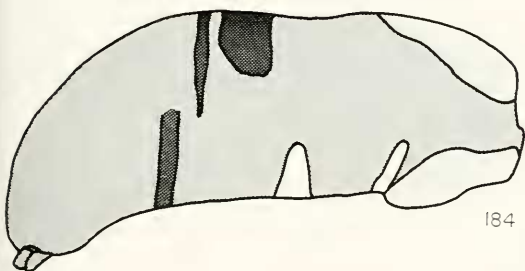
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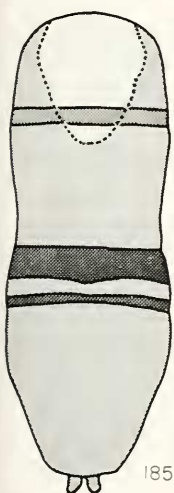
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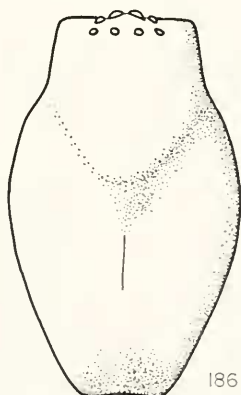
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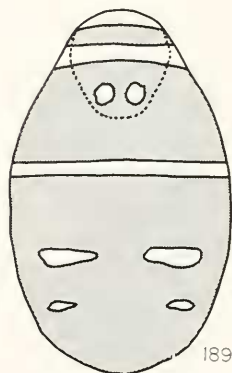
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(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

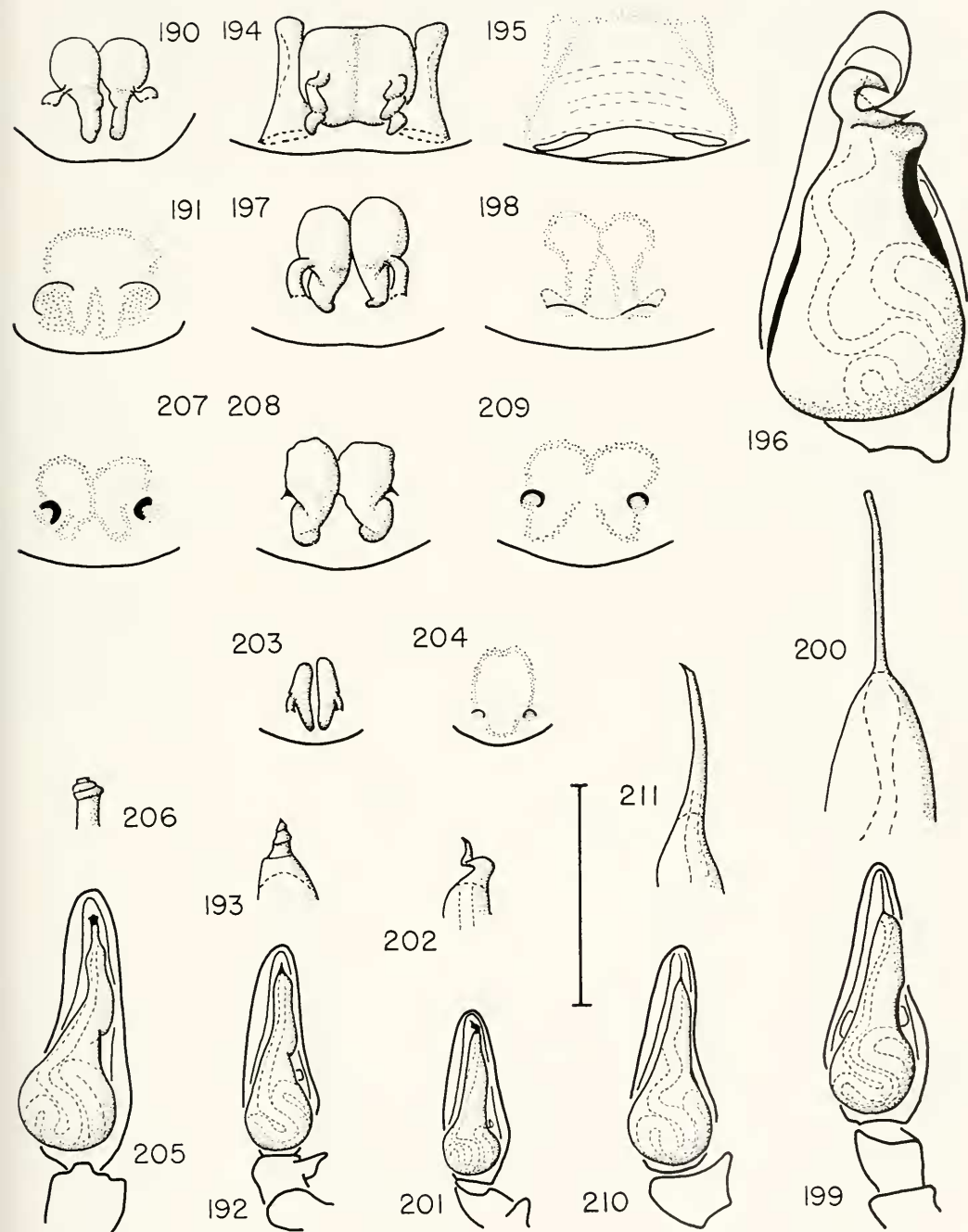


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(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

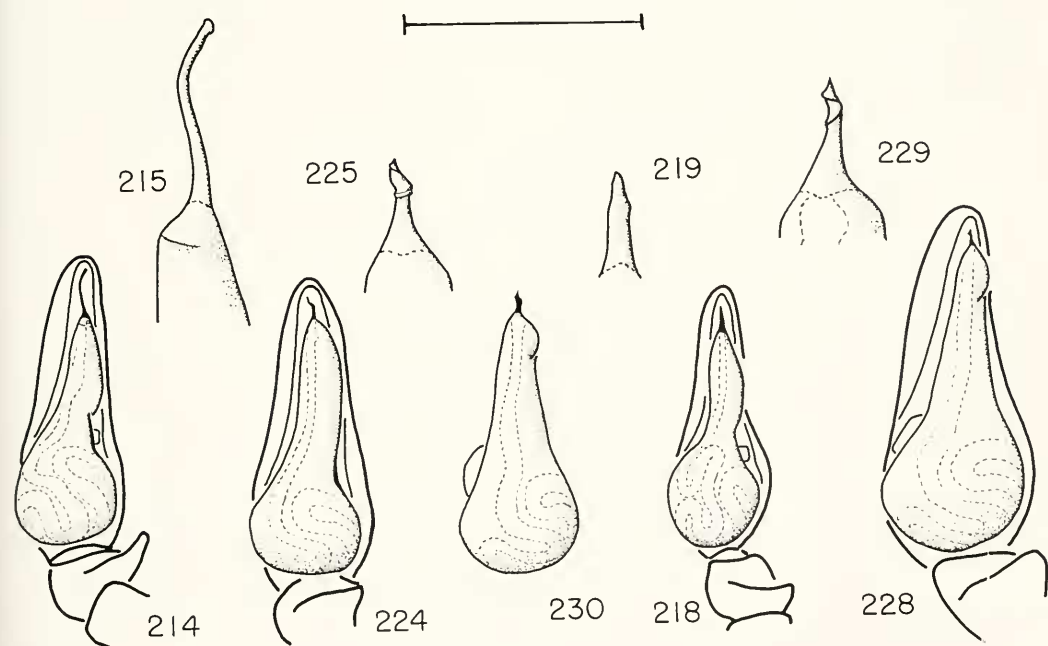
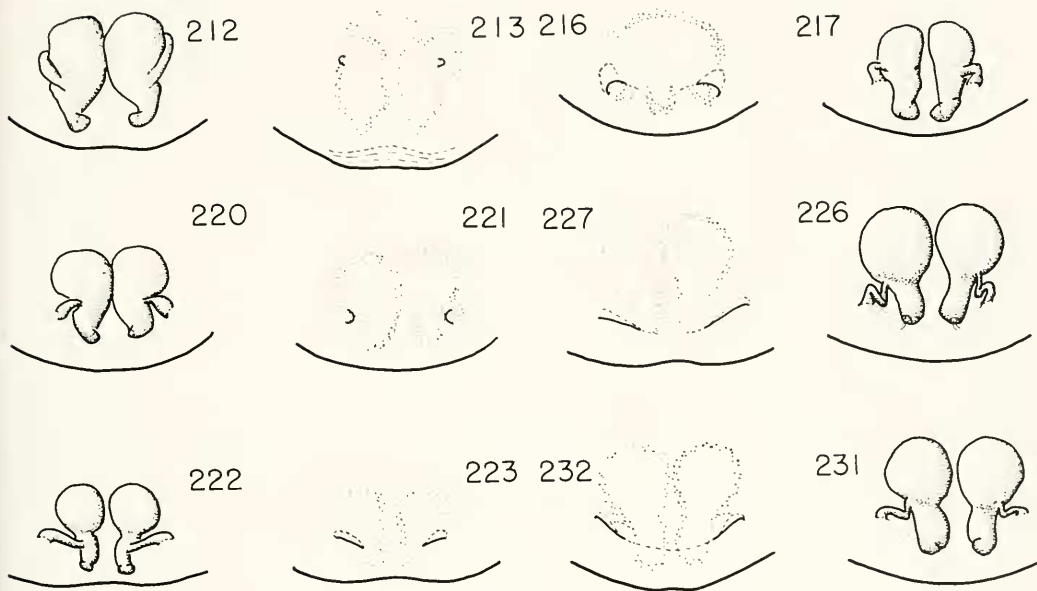


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(Scale line for epigyna, palpi or genital bulb = 0.59 mm; for emboli and end of genital bulb = 0.15 mm.)

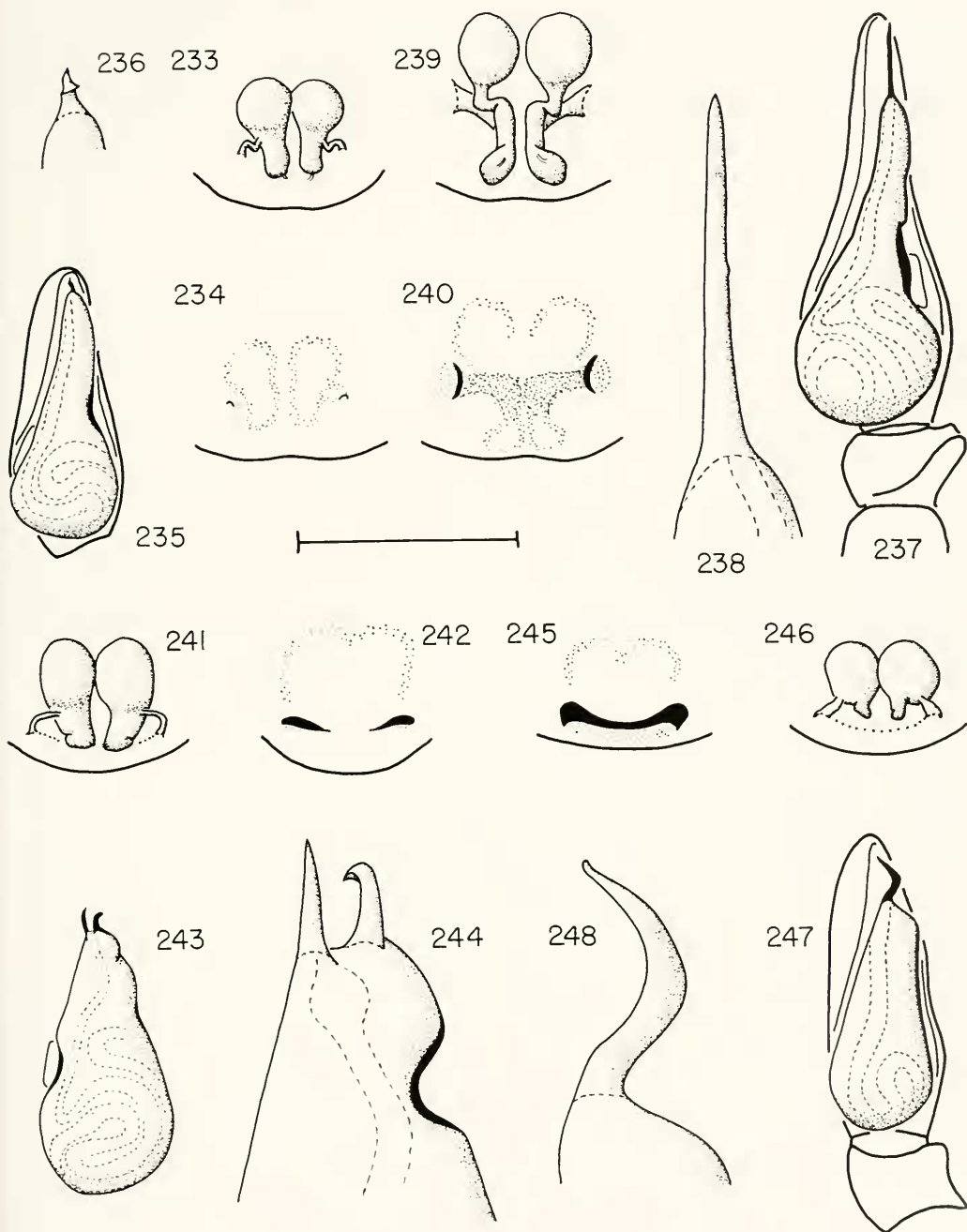


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(Scale line for epigyna and palpi = 0.59 mm; for emboli = 0.15 mm.)

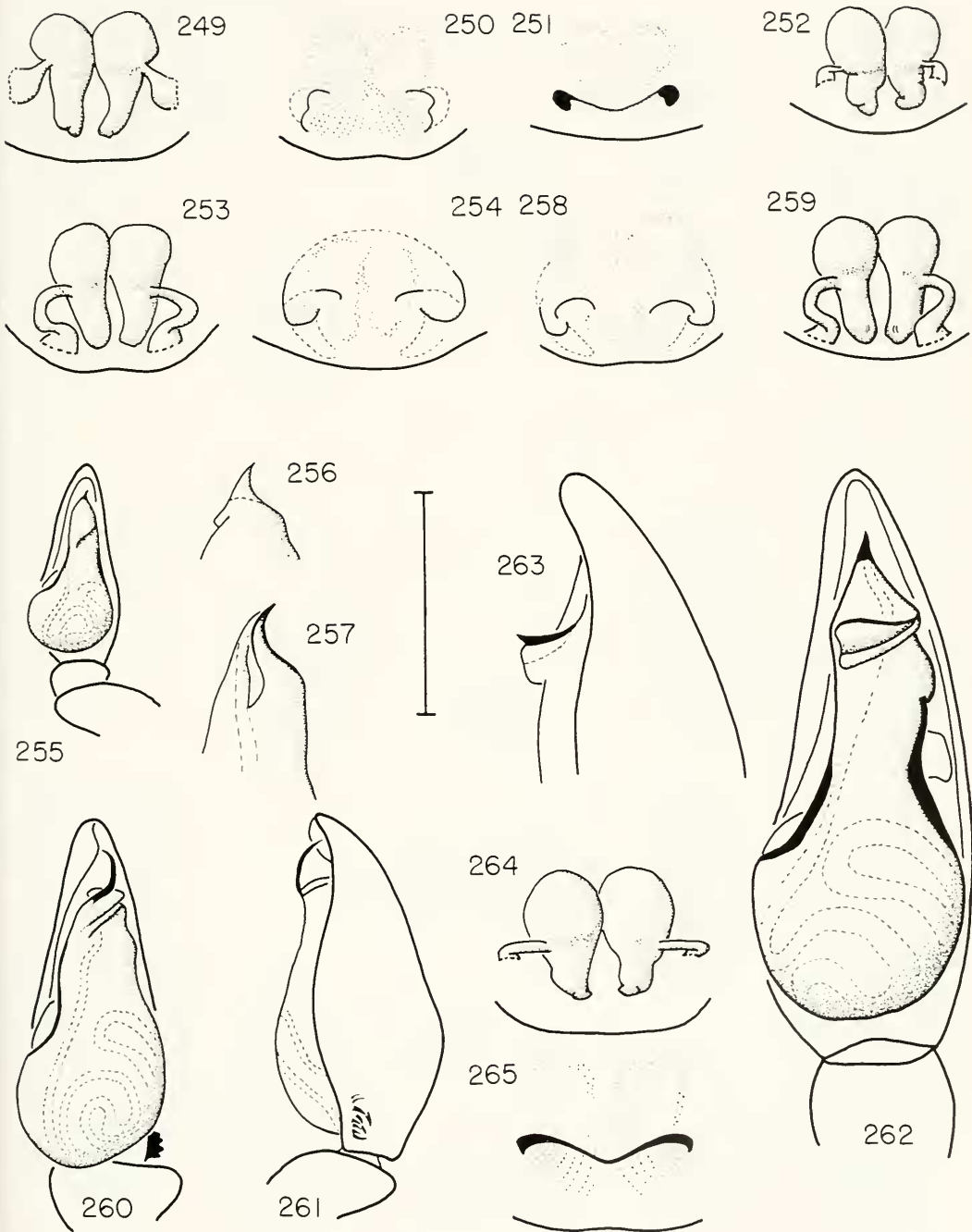
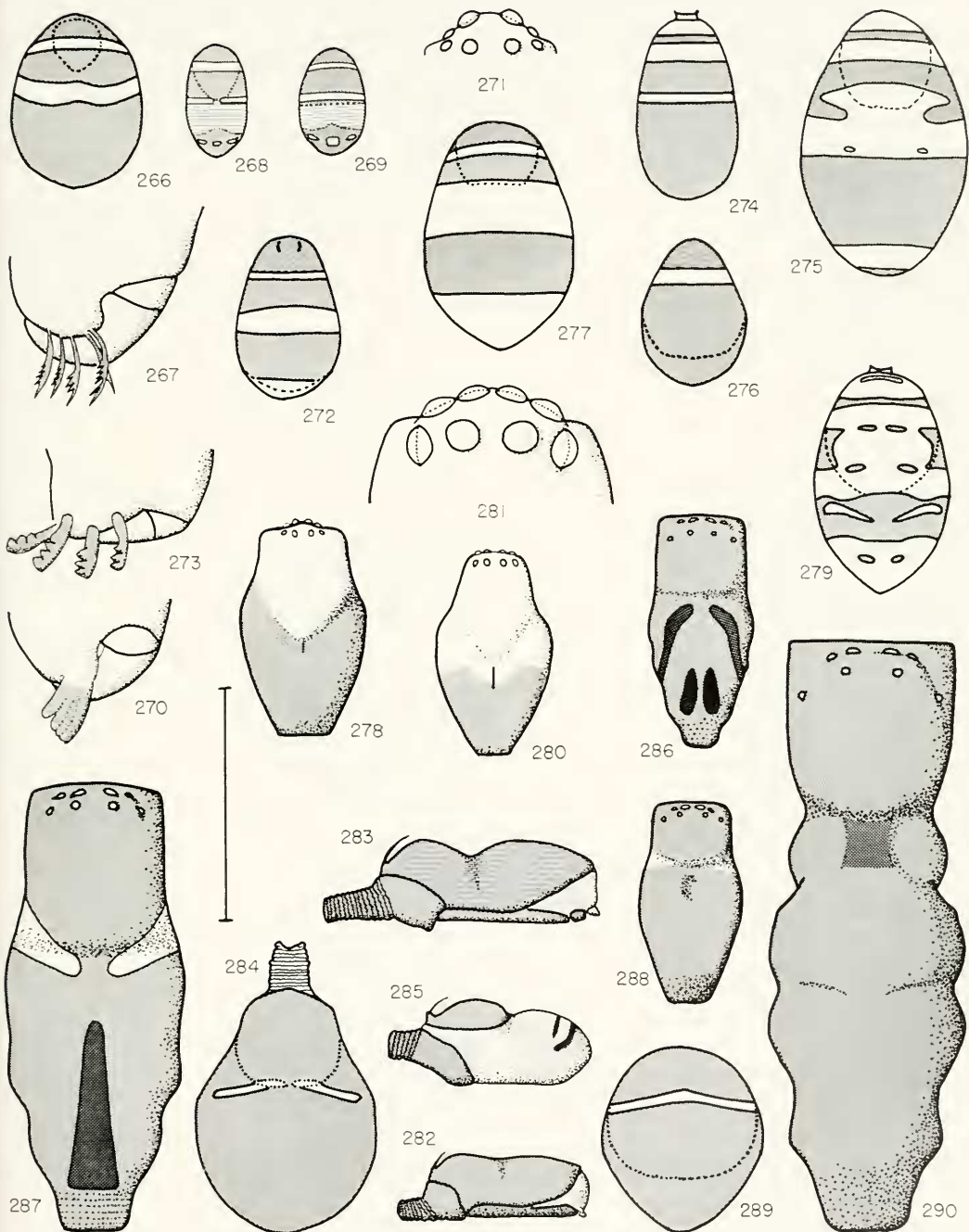


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(Scale line for abdomens and carapaces = 2.72 mm; for eye regions = 0.94 mm; for cheliceral apices = 0.24 mm.)



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